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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Gunshot Wounds of the Knee-joint
ST. J. D. BUXTON, FRCS..... 681

Reflections upon Reform in Medical Education. III. Medical Research within the Teaching School
Sir THOMAS LEWIS, FRCP, FRS 685

Effect of Vitamin-C Deficiency on Experimental Wounds: Tensile Strength and Histology
GEOFFREY H. BOURNE, D SC (*illus.*) 688

Pruritus Ani: A Practical Approach
ALFRED J. CANTOR, MD.....692

Tissue Culture of Malaria Parasites (*Plasmodium gallinaceum*)
FRANK HAWKING, DM, DTM (*illus.*) 693

SPECIAL ARTICLES

A Clinical View of Shock
V. ZACHARY COPE, FRCS..... 703

General Medical Council: President's Address..... 705

Medicine and the Law: Fresh Inquest Ordered..... 706

REVIEWS OF BOOKS

Psychological Effects of War on Citizen and Soldier. R. D. Gillespie..... 694

Health and Hygiene. Lloyd Ackerman 694

Dental Histology. James Aitchison, LDS; John S. Dick, LDS .. 694

NEW INVENTIONS

Kymographic Apparatus for Uterotubal Insufflation. ALBERT SHARMAN, MD (*illus.*) 694

LEADING ARTICLES

WOUND SHOCK..... 695

HÆMOLYTIC STREPTOCOCCUS AND SCARLET FEVER..... 695

THE SCIENCE AND THE ART..... 696

ANNOTATIONS

Drugs under the Tongue..... 698

Toothache and Aviation..... 698

Dust in Foundries..... 698

Midwives in the Service..... 699

Rickets in War-time..... 699

Cephalhæmatoma 700

How Hot is a Burn?..... 700

RECONSTRUCTION

Minister and BMA: Reply to the Council's Statement..... 701

An Administrator on the White Paper's Proposals..... 702

ON ACTIVE SERVICE

Awards 708

PARLIAMENT

On the Floor of the House..... 707

From the Press Gallery: Malaria in West Africa..... 708

Question Time: Certification—Professional Secrecy—Production of Penicillin—Notification of Leprosy—Smallpox at Yeovil—Vaccine Lymph—Vaccination of Non-contacts 708

OBITUARY

Captain James Joseph Docherty, MB (*portrait*) 711

Captain Caleb Greenwood Penny, MRCS (*portrait*)..... 711

Dr. Waldemar Bartholin Sommers 711

Appointments..... 712

Births, Marriages and Deaths.... 712

PUBLIC HEALTH

"Scarlet Fever"..... 711

Infectious Disease in England and Wales 711

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents.... 706

LETTERS TO THE EDITOR

Notification of Tuberculosis: the Patient with a Primary Infection (Dr. R. Livingstone)..... 709

The White Paper Reviewed (Mr. H. R. Arthur, FRCSE)..... 709

Sulphonamides in Dermatitis Herpetiformis (Dr. Paul Kaznelson) 709

Rubella and Congenital Malformations (Dr. C. Swan)..... 710

The Laboratory Technician (Mr. J. M. Signy)..... 710

The Bridge in Gall-bladder Surgery (Air Vice-Marshal Geoffrey Keynes, FRCS) 710

"Q" and Antibody (Dr. R. E. Smith)..... 710

Supply of Bodies for Dissection .. 710

NOTES AND NEWS

A Centenarian Nurse..... 712

University of Sheffield..... 712

Royal College of Surgeons of Edinburgh..... 712

Exhibits in Edinburgh University Library 712

Harveian Society of London..... 712

Local Planning of Rehabilitation 712

Certificate in Psychiatric Social Work..... 708

British Medical Bulletin 712

Cancer Control Organisation for Edinburgh and S.-E Scotland .. 692

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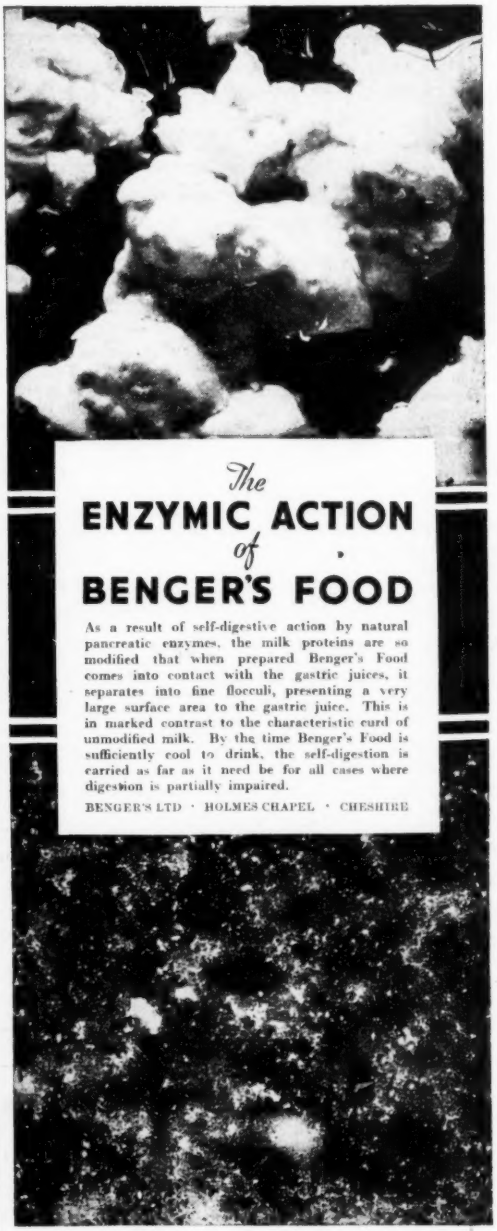
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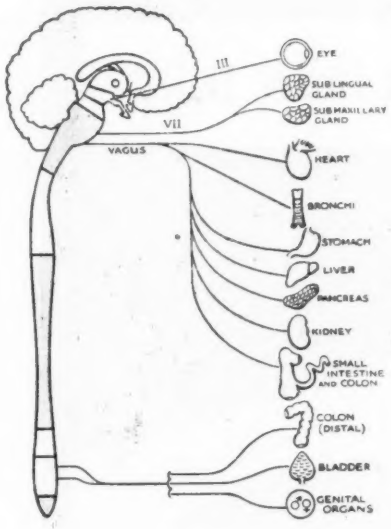

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References: (1) *Lancet, i,* 575 *(March 9th,* 1935); (2) *Zbl. Neurochir.,* 1942, *No.* 1/3.

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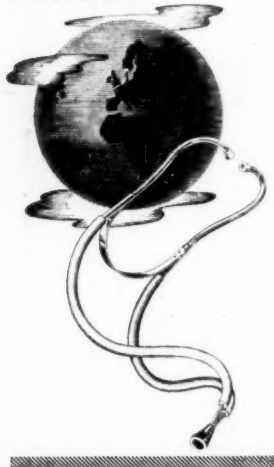

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* Amer. J. Digest. Dis. 1940, 7.24.

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GUNSHOT WOUNDS OF THE KNEE-JOINT*

ST. J. D. BUXTON, MB LOND, FRCS
SENIOR ORTHOPÆDIC SURGEON, KING'S COLLEGE HOSPITAL, LONDON

A DECADE or so before the destruction of the Spanish Armada Ambroise Paré was writing on "gunshot wounds of joints."[31] His most impressive words were: "Indeed they are always dangerous." This is still true, for what at first appears a slight wound is liable to endanger a patient's limb or life.

John Hunter, with his experience of war surgery, wrote:[21]

"It is from the disposition that the cavities of joints have to fall into the suppurative inflammation when an opening is made into them, that union by the first intention does not take place. . . . When they suppurate it is very tedious, and then the parts are apt to die and slough, which makes these accidents of such dangerous consequence. . . . We should avoid making stitches because they tend to produce inflammation, as was explained under wounds of the abdomen."†

These words indicate that Hunter taught the principles of infection and healing of an injured joint. Subsequently these principles were taught by Lister. It is fair to ask, "Have we forgotten them today?"

Reyher and von Bergmann[34] in the Russo-Turkish war of 1877 laid the foundation of the modern treatment of wounds of joints, based on avoidance of interference and prevention of infection. The treatment was particularly successful in subsequent campaigns, when the small-bore bullet with a greater velocity was in use, so that in the early part of this century joint wounds due to this missile were seldom dangerous. In fact Follenfant[16] reported that in 1904 at Harbin 1382 penetrating wounds of joints were treated with 7 deaths and only 72 resections.

Of a series of 95 cases reported from the South African war, 50 were perforations and 55 required no treatment beyond rest and aseptic dressings. Incisions were required in 7 cases without further interference, and amputation was performed in 11 cases with 4 deaths. One case in which the popliteal artery was wounded was treated by ligature of the femoral in Hunter's canal with a satisfactory result.[30 36]

THE GREAT WAR

Surgeons with experience of wounds in the South African war were early in France—notably three past presidents of the College of Surgeons, Bowlby, Makins and Cuthbert Wallace. It was quickly realised that the wounds caused by high-explosive shells and machine-gun bullets were more liable to infection than those due to shrapnel balls and the rifle bullet used in earlier years.

Two methods of treatment of gunshot wounds of the knee-joint attracted attention, and were at variance with each other. Willems advocated immediate mobilisation of the joint, whereas the majority of British surgeons favoured immobilisation until all signs of inflammation had disappeared.

In 1909 Willems[35 40] had advised aspiration and movement for traumatic hæmarthrosis; in 1917 he treated gunshot wounds by excision, removal of foreign body and loose bony fragments, and closure. Immediate active movement was then employed. I saw this demonstrated by Cotte, who made the patient bend his knee, regardless of pain. If suppurative arthritis followed, the sutures were removed and movements continued, the discharge being pressed out of the wound as movement took place. Passive movements were not employed.

This method was not favoured in British hospitals, but American surgeons gave it a more extensive trial, notably McWilliams and Hetzel.[23 24]

In 1917 Moynihan[27] enunciated certain principles of the treatment of this lesion, the first of which was that the limb should be fixed immovably upon a splint at the earliest possible moment and until circumstances and surroundings permitted of a complete operation. In the same year there was a discussion at Rouen, the principal speakers being Barling,[3] Gray,[18] Max Page[30] and Ogilvie.[28] Barling analysed the treatment of 845 gunshot wounds of the knee-joint (table I).

TABLE I—TREATMENT AND RESULTS OF WOUNDS OF KNEE (BARLING)

Wounds of the knee—	845
with bony injury	438
without bony injury	407
Wound excised and joint closed—	322
further operation required in	82 (25·5%)
Wound excised and joint packed—	336
further operation required in	128 (38%)
Excision of the knee-joint	42
Arthrectomy	15
After excision or arthrectomy: amputation performed in	13
Deaths after excision or arthrectomy	13
Amputation without excision	151
Of these deaths occurred in	49 (32%)
Total amputations	164 (19·4%)
Total mortality	72 (8·5%)

Barling was a strong advocate of mechanical cleansing of the joint, stressing that the nature of the fluid employed was of little importance.

Writers[5 12 26 22 11 6 9 19 37 22 9] on this subject during those war years were interested in mechanical irrigation, in Carrel-Dakin treatment, closure of the joint and the indications for resection of the joint.[13 17] Immobilisation is emphasised, notably by Bazin[3] and Monsarrat[26] and others,[25 10] but extension by strapping was not in constant use.[20] Windows in plasters were popular, to enable dressings to be changed, or for irrigation of the wound or joint. Quick[33] and others employed arthrotomy and then placed the knee in a position of 90° flexion. Metcalf[25] advocated freedom of the limb from all splintage. Bazin[3] appreciated the difficulty of being dogmatic with regard to the time for commencing movement, for he states that restoration of function should be commenced "not too late and not too soon." Everidge[15] advocated graduated passive movement on the 10th day or earlier before active movement was commenced. In a Hunterian lecture in 1917 on gunshot wounds of joints, Frank Cook reviewed experiences in France, including those of knee-joint wounds.[7]

In the casualty-clearing stations in Macedonia, Gauntlett, Julian Taylor and I had been employing conservative methods, under the guidance of English and Kelly. However, by 1918 we were practising immediate excision for cases in which there was mutilation of the bones at the joint, and in certain cases when infection had become established.[14]

There was no postwar review of any large group of cases, nor was the work under the guidance of Sir Robert Jones at the special military and pensions hospitals reported. O'Reilly reviewed the work of the United States Medical Corps.[29]

THE POSTWAR PERIOD

After the Great War road accidents caused many injuries to the knee-joint. It is reasonable to assume that the experience of gunshot wounds of the knee influenced the treatment of the open wound and of the open fracture into the joint. These cases have been treated by primary excision of the wound edges, closure of synovial membrane and by fixation with extension. Mechanical irrigation has largely fallen into abeyance. Undoubtedly the amputation-rate and mortality from the knee-joint injury have been low, but stiffness of the knee has been a common sequel.

THE WORLD WAR

Great Britain, 1940.—Experience in France was too small to be of any value. Wounds due to bombs in the summer of 1940 provided two new features. The wounds resulted from small pieces of metal projected into the joint at a very high velocity, and treatment began only a few hours after the joint was injured. It was not uncommon to find several small jagged wounds around the knee, through which pieces of metal, varying in size from a bean to a pin's head, had been projected.

I had under my care at one time 3 such wounds, all with comminution of the condyles of the femur. Primary opera-

* Hunterian lecture delivered at the Royal College of Surgeons of England, April 14, 1944.

† The lighter and cooler the dressings in this sort of accident the better. Perfect repose of the organ, an easy position . . . simplest mode of treatment.

tion had been performed three hours after the injury; this was excision of the wound, removal of obvious pieces of metal and loose fragments of bone, followed by dressing with sulphanilamide powder, paraffin gauze and application of plaster-of-paris. The first dressing and change of plaster was carried out in 16 days and there was no suppuration in any joint, although the whole of one femoral condyle was lost in 2 of the 3 cases.

Early operation—so often possible for air-raid casualties—appears to be a cogent factor in the prevention of suppuration.

Middle East, 1941–42.—In the Western Desert the majority of wounds and the facilities for surgery were entirely different from those on the Western Front in 1914–18.

Wounds were caused by shell fragments, rifle bullets, bombs and mines, a number being the result of actions in the Mediterranean. Those caused by mines and bombs were usually multiple, and often each area of the body injured was penetrated by several or many pieces of metal. The limbs were particularly affected. Facilities for operation in the forward area were primitive; but medical supplies, including transfusion necessities, surgical instruments and plaster-of-paris, were available. Operations were performed in tents or pent-houses attached to the lorries, except at Tobruk and Mersa Matruh where the operating-theatres were excellent.[4]

At times many of the wounded received the primary operation in a forward area, being transported by sea or by road and train to the base. At others no operative treatment was carried out until the base was reached.

During this period I was able to see many surgeons at work and they sent me reports on wounds of the knee-joint received during the Second and Third Libyan battles. Thus I have been able to study 273 wounds and draw some conclusions from our experience (table II).

TABLE II—GUNSHOT WOUNDS INVOLVING THE KNEE

—	2nd Libyan battle	3rd Libyan battle	Total
Patients	99	156	255
Knees affected	108	165	273
Non-suppurative arthritis	58	120	178
Suppurative arthritis	30	45	95
Amputations	7	5	12
Deaths	2	3	5

In the forward area it is seldom possible to study detail of the lesion, so the types of injury in relation to treatment will be considered subsequently. Possibly this will help to emphasise the fact that the treatment in the forward area is primarily that of the wound—mechanical by operative measures with immobilisation of the limb and chemotherapy.

TREATMENT AT A FORWARD OPERATING-CENTRE

The patient will probably arrive on a stretcher, but a few will manage to travel as sitting cases. If a joint injury has been diagnosed, and conditions allow of it, the limb is placed on a Thomas splint or the two limbs are tied together near the fighting line.

1. The wound is excised, by the method employed for any wound. If more than 24 hours have elapsed since the injury, enlargement of the wound is advisable, and may be of greater value than excision. Obviously 24 hours is an arbitrary time; to lay down rules regarding the time factor will lead us astray. When the synovial membrane is lacerated, the edges of the wound should be excised. In the early case debris and blood-clot should be removed from the joint and the synovial membrane closed with a few catgut sutures. In the later case mechanical irrigation by several pints of fluid is recommended. The quantity of fluid is probably the important factor, so if a sterile solution is not available an antiseptic one is used. The synovial membrane is not closed in the late case nor in any knee when infection appears likely to arise.

Fixation of the limb, as if the femur was fractured, is employed by placing the limb on a Thomas splint and using one-way-stretch 'Elastoplast,' applied on each side of the limb and tied to the end of the splint. The addition of plaster-of-paris, covering limb and knee, with a split down the front of the cast, is desirable if the subsequent journey is to be lengthy.

2. When the wound is due to a bullet (rifle or machine-gun), no excision is necessary, unless the exit wound is of the "explosive" type.

3. Amputation, through the joint or above the femoral condyles, is indicated when the main vessels are injured and the foot cold.

4. If the missile has caused comminution of the patella, removal of all fragments of the bone is advisable. This was followed by closure of the joint and skin, with success in a few cases. When the femur or tibia is fractured as well as the patella, I do not advocate removal of the patella at a forward area.

5. During this war I have had no experience of primary excision of the joint. It does not appeal to me as an operation for a forward area, nor is it wise to expose so large an area of cancellous bone as that of the lower end of the femur and upper end of the tibia, when infection may follow.

TREATMENT AT THE BASE

At the base it is possible to study the types of wounds. The common types are:

1. Effusion without retention of the missile in the joint:—
   (*a*) The synovial membrane is either bruised, or there is a penetration into the synovial cavity.
   (*b*) The missile has passed through the synovial cavity and articular cartilage and lodged in the bone, or has entered the bone and caused a fracture into the joint, without severe comminution.
2. The missile has penetrated the joint and lies in the synovial cavity or articular end of the bone.
3. There is great comminution of the bones of the joint, usually without retention of the missile.

When a patient arrives at the base, it is difficult to determine into which category his wound falls.

Fixation.—As rest for the joint is probably important, it appears unwise to be meddlesome. The first necessity is to immobilise the limb by a method which will hold the joint 5° short of full extension, with slight separation of the bones. This can be done with a Thomas splint and strapping with a pad behind the knee; "fixed" or "weight" extension is used according to the likes of the surgeon. Charts of temperature and pulse are essential, for a rise of either or both may indicate that the joint is infected.

Skeletal traction is contra-indicated. It is unnecessary to draw the ends of the bone farther apart than is done by strapping, and the track of the pin or wire is likely to become infected.

Chemotherapy.—All these cases had one of the sulphonamide drugs orally, usually 25 grammes in 5 days. Local application of sulphanilamide was used in some hospitals.

Aspiration.—When the joint is distended, a needle (not smaller than that used for lumbar puncture) should be inserted, and by means of a syringe the joint should be emptied as much as possible. This aspiration is diagnostic, in that one can ascertain whether the joint is infected, and therapeutic by removal of the fluid. Mild infection will frequently subside after three or more aspirations of the joint, performed at intervals usually of 48 hours.

Removal of metallic fragments.—If the missile appears from radiography to be in the joint cavity or in the articular cartilage, its removal will be necessary. But it should not be removed during the first few days if the fluid in the joint is sterile. Operation three weeks or so after wounding is less likely to produce a reaction which may turn the scales and be followed by suppurative arthritis. However, if the joint is infected, the metal should be removed as soon as possible, preferably by enlarging the wound of entry.

Not infrequently a piece of metal about the size of the crown of a molar tooth has penetrated the joint and become impacted in a condyle of femur or tibia. Its removal is difficult, and usually necessitates opening up more cancellous bone. If it is left in the bone and the joint is infected, suppuration may subside after many weeks with aspiration or drainage, but ankylosis occurs. When there is a track from an infected joint to a piece of metal impacted in cancellous tissues, the foreign body

should be removed, preferably by access along the track it has made.

RESTORATION OF FUNCTION

When no suppuration has taken place, movement of the joint may be expected. The prognosis is best when the missile has been a bullet or small piece of metal which has passed through the joint, causing no fracture or a small crack. The longer immobilisation is required, the less the movement.

Movements of toes and ankle are started immediately, except in the ill patient. In the straightforward case, the patella is moved laterally in 2–3 weeks and quadriceps contraction encouraged.

If the knee is quite comfortable and a "test"—by lifting the limb and encouraging the patient to move the knee—causes little discomfort, active movement should be started. This will seldom be before 3 weeks and is usually 5 or 6 in the straightforward case. It is difficult to decide when weight-bearing should be allowed. Pain or spasm on active movement or when walking is first allowed indicates that these activities are being started too soon.

Future treatment is on the lines of the present-day principles for regaining knee movement and muscle tone.

THE INFECTED JOINT

Early arthritis.—If repeated aspiration has failed, in that the joint distends quickly, and the patient has a raised temperature and increased pulse-rate, or his general condition is deteriorating, perhaps with an increasing pulse-rate but a temperature seldom above 99° F., further surgical intervention is needed.

The joint is opened on each side by a lateral incision, placed as far back as possible, but opening the suprapatellar pouch and at the lower ends being in front of the lateral ligaments. The contents of the joint are given free exit by holding open the sides of the incision and expressing the fluid. There is no consensus of opinion as to the value of irrigation, but if it is employed a large quantity of fluid is used, under such pressure as is produced by a Higginson's syringe or an irrigation can placed some feet above the operating-table. The injection of antiseptics has no advantage; drainage tubes should not be employed; and posterior drainage by incision is to be avoided.

The synovial membrane is closed with a few interrupted catgut stitches in the mild case, but left open if the patient is ill or if there is doubt about his limb or life. The limb is immobilised. The addition of plaster-of-paris to any apparatus used is certainly of value in that fixation is more secure and the dressing is left in situ, whereas a gauze and wool dressing becomes saturated and uncomfortable and frequent change is liable to lead to secondary infection.

It is interesting to note that in this series of 273 cases reaching the base hospitals, suppurative arthritis developed in 95 (34·8%). The amputation-rate, in relation to suppurative arthritis alone, was 12·6% (or 4·4% for the whole series of 273 knees).

Prolonged suppuration.—This may affect the patient's general condition so that limb and life are in danger (see below). Or there may be a continued purulent discharge from the joint when the patient's general condition is satisfactory. Some of this group of patients have been seriously ill for 10 days or so, but toxic signs have subsided.

Blood-transfusion was used as part of the treatment of septicæmia and suppurative arthritis. Lieut.-Colonel G. A. H. Buttle agreed with me that the result of a large transfusion was usually better than that following two or three, each of 500 c.cm.

When there is prolonged suppuration, pus may burst through the softened capsule and form an extra-articular abscess. If the infection is low-grade and the lateral incision is placed too far forwards, the abscess appears on the outside of the thigh. Alternatively, pus may penetrate the capsule posteriorly—probably above the oblique upper border of the posterior cruciate ligament, or by a track along the tendon of the popliteus muscle—and come to lie behind the tibia at the top of the calf. An abscess in this area is a serious complication. It was common during the Great War, but appears to be infrequent now. The use of a posterior knee-pad, or plaster fitting snugly around the back of the joint, prevents pus tracking posteriorly. These abscesses in muscle should be opened by incision directly over them. Pus should not be allowed to find its way to the surface via the openings in the joint (Armstrong [1]).

It is important to allow the ends of the tibia and femur to come together when ankylosis is expected. This is usually the most satisfactory end-result of suppurative arthritis of the knee.

When the patient's general condition is good and suppuration is not subsiding after some weeks, X-ray examination may reveal sequestration of the end of one or more bones. Sequestra protruding into the joint cavity should be removed, and if the patella was comminuted and has sequestra separated or separating, the bone and sequestra should be removed.

Although some of these knees regain 30°–75° of movement, it is usually painful and the gradual development of osteoarthritis produces an increasingly painful joint. Some soldiers have recently asked me to amputate a limb with an ankylosed knee, but I believe bony union carried out by Nature or by the operation of excision performed after all suppuration has ceased is the best end-result that can be offered to the patient whose knee has been affected severely by suppurative arthritis. Arthroplasty of the knee has not yet met with success in this country.

AMPUTATION

In the forward area amputation is required when there is gross injury to the vessels. A few patients reach the base with this complication. Apart from this, it may be necessary to amputate to save life threatened by secondary hæmorrhage or by deterioration of the patient's general condition. (Septicæmia is usually present and there is persistent pyrexia of 102°–103° F.) Or amputation may be required because there is a severe suppurative arthritis with pus tracking into the thigh or leg or both, affecting the patient's general condition, as shown particularly by loss of appetite, lack of sleep and increasing anæmia.

It is usually possible to perform a low thigh operation leaving a 10-inch stump, as measured from the trochanter. It may not be advisable to close the skin flaps at the time of the operation.

Whether amputation is necessary and when it should be performed are two of the most difficult decisions that a surgeon has to make in war surgery. This is well shown by detailed study of the 12 amputation cases in this series (table III).

TABLE III—AMPUTATIONS AT THE BASE

Indication	No. of days between wounding and amputation	No. of cases	Death or recovery
Septicæmia and severe suppurative arthritis	25, 27, 34, 53, 86	5	1 D, 4 R
Pyæmia or septicæmia	30, 30, ?	3*	1 D, 2 R
Secondary hæmorrhage with severe supp. arth.	36	1	D
Severe supp. arth. with deteriorating general condition	17, 133	2	R
Supp. arth. with vascular complication causing gangrene	14	1	R
Total		12	Deaths 3

* One of these had the left thigh amputated on the field, and disarticulation of the right knee at the base.
Amputations in the field are not included.

There were fractures into the knee-joint in each of these 12 cases; in 5 the tibia, and in 2 both femur and tibia, were fractured. Foreign bodies had been removed from the joint in 3 knees. Secondary hæmorrhage occurred in 2 amputation stumps; 1 of these cases was fatal.

MORTALITY

A study of the causation of death (table IV) may be helpful to surgeons faced with difficult decisions.

TABLE IV—DEATHS

Operative intervention	Cause	No. of cases	Amputation days after wounding	Death: Days after wounding	Death: Days after amputation
Without amputation	Pulmonary embolism *	1	..	44	..
	Supp. arth. and paratyphoid fever	1	..	27	..
After amputation	Pyæmia † (multiple wounds)	1	30	57	27
	Septicæmia	1	25	29	4
	Secondary hæmorrhage from stump	1	17	26	9

* Autopsy showed, in addition to pulmonary embolism, parenchymatous degeneration of liver and kidneys and septic splenomegaly.
† The other limb had been amputated on the field. Patient developed suppurative parotitis and pyæmic abscesses.

WOUNDS OF BOTH KNEES IN THE SAME PATIENT

Almost every type of lesion occurred in the knees of the 18 soldiers wounded in both joints.

Early Restoration of Function

CASE 1.—Lieut.-Colonel, aged 23. Wounded Nov. 20, 1941, by machine-gun bullet or 2 bullets. Each joint was penetrated from side to side, probably when semiflexed. There was no bony injury to the right, and there was slight injury to the tibial spine of the left. No operation was carried out. Immobilisation by plaster was employed for 15 days, and 30 days after wounding the right knee had full extension, with flexion limited by 45°. The left knee extended fully and flexed 80°.

CASE 2.—A rifleman had similar wounds by machine-gun bullets, but there was a wound in one popliteal space. He returned to his unit 35 days after being wounded, with full movement of the left knee and slight limitation of flexion in the right.

Both these patients were treated by the late Brigadier J. Eastwood.

Suppurative Arthritis; Reacting to Treatment

CASE 3.—A bombardier was wounded on Dec. 13, 1941, by shell. On Dec. 15 excision of wounds; no sutures; foreign bodies not removed; sulphonamide powder sprinkled in joint; paraffin gauze. Plaster-of-paris on Dec. 23. Temperature raised. Right knee: fracture of lateral femoral condyle; wound 1½ × 2 in. but not discharging freely. Aspiration 60 c.cm.

Left knee: foreign body retained, probably partly embedded in femur. Wound clean. Dec. 31: aspiration of right knee (culture hæmolytic streptococcus) and further incision with irrigation of the joint (flavine 1 in 1000). Synovial membrane and capsule closed on medial side. Jan. 5, 1942: afebrile. Jan. 12: wounds clean and general condition satisfactory. He had 23 grammes of oral sulphonamide.

Suppurative Arthritis with Complications

Two cases have already been reported. Both had double amputations on different dates, one recovering and the other being fatal.

CONCLUSIONS

My ambition to report the condition of these joints after an interval of a year or two has not been fulfilled, for at this stage of the war it is impossible to obtain records of scientific value. Hence the lessons learnt from such as have come to hand are reported from fewer individual cases than I wished. However, a number of conclusions are put forward.

Wounds of the knee-joint in the Western Desert caused less gross destruction than in the Great War, as they were usually caused by smaller missiles.

Penetration by pieces of metal into the joint, or into the end of the femur or tibia, was frequent. These foreign bodies, when in the joint or protruding into it, should be removed at the primary operation, if the approach is simple and no extensive dissection is necessary. An operation to remove such metal 14–28 days after wounding is liable to be followed by an acute inflammatory process and a stiff knee. Removal after this period often proves unnecessary and may not increase the function of the joint.

Fractures into the joint resulting from a missile increase the liability to joint infection. Further, the more severe the comminution, particularly of the femur, the greater the chance of severe suppurative arthritis. Early removal of a patella comminuted by a missile, when neither femur nor tibia is fractured, is usually followed by a straightforward convalescence.

Oral chemotherapy and local application of a sulphonamide drug has been a routine, as has the early operative treatment of the wound. It is impossible to assess the value of the one without the other. Until experience with penicillin is greater, these remain the methods of choice during the first few days.

Fixation is essential and is best accomplished by skin traction with the limb in a Thomas splint, with plaster-of-paris round the limb. An inspection lid over the wound, which is a removable and replaceable part of the plaster cast, is often useful. Release of the extension is indicated when ankylosis is the surgeon's aim.

When general and local signs and symptoms suggest that infection is increasing, the immediate policy should be definite and consist in aspiration and lack of disturbance. Lateral incisions may be required, but excision of the joint is not advised.

The indications for amputation have been stated with the realisation that in each case the surgeon is faced with a difficult decision.

The means of regaining joint movement is a fascinating study, perhaps made more so by the introduction of the word rehabilitation. A knee-joint perforated by a missile has not necessarily limited movement subsequently, but a joint rarely regains full movement if a missile is retained.

Cases that have caused anxiety during the early treatment may regain considerable mobility—e.g., after 75 days there was only 10° of movement of a knee in a soldier who now has full extension and flexion to a right angle.

Suppurative arthritis resulting from a gunshot wound of the thigh causing a fracture of the femur extending into the joint has purposely been excluded from this group of cases.

SUMMARY

The treatment of wounds of the knee-joint, particularly during the present century, is reviewed.

A detailed account of 275 gunshot wounds of the knee-joint, which reached base hospitals during two Libyan campaigns, shows that suppurative arthritis developed in 34·8%; the amputation-rate was 4·4% and the mortality-rate 1·8%.

The low rates of amputations and mortality are accounted for by the small size of the missiles causing the injury, by early operation, by the use of sulphonamides and immobilisation of the joints.

Treatment in the forward and base areas is described, and exemplified particularly by cases of injury of both knee-joints.

BIBLIOGRAPHY

1. Armstrong, A. C. personal communication.
2. Barling, G. (1917) *Brit. med. J.* ii, 277.
3. Bazin, A. T. (1920) *Canad. med. Ass. J.* **10**, 416.
4. Buxton, St. J. D. (1943) *Brit. J. Surg.* **31**, 111.
5. Campbell, J. and Woolfenden, H. F. (1917) *Lancet*, ii, 185.
6. Charles, R. (1918) *Brit. med. J.* i, 713.
7. Cook, F. (1917) *Lancet*, i, 711.
8. Cumston, C. G. (1918) *Ann. Surg.* **67**, 170.
9. — (1919) *N.Y. med. J.* **109**, 64.
10. David, V. C. (1919) *Ann. Surg.* **70**, 290.
11. Dixon, R. G. (1918) *Lancet*, i, 404.
12. Dolbey, R. V. (1917) *J. R. Army med. Cps*, **28**, 35.
13. Emerson (K.) (1918) *Amer. J. orthop. Surg.* **16**, 311.
14. English, T. C. and Kelly, R. E. (1918) *Brit. med. J.* i, 305.
15. Everidge, J. and Fullerton, A. (1919) *Ibid*, ii, 182; (1919) *Brit. J. Surg.* **6**, 566.
16. Follenfant (1906) *Arch. Méd. Pharm. milit.* **48**, 90.
17. Gill, F. L. (1918) *Med. J. Aust.* i, 84 and 102.
18. Gray, H. M. W. (1917) *Brit. med. J.* ii, 278.

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REFLECTIONS UPON REFORM IN MEDICAL EDUCATION*

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III. MEDICAL RESEARCH WITHIN THE TEACHING SCHOOL

In the first of these three articles our ignorance of disease and its manifestations was stressed. No actual measure of this ignorance can be taken. We can judge sufficiently, however, from the facts that the patient is rare who presents no problem, and that disease is in very many patients quite mysterious. Thus the need for research is abundantly clear. A research worker entering a ward or outpatient department has no difficulty in seeing problems; rather he is bewildered by the number of unanswered questions. He must choose from among them one or more that he realises is capable of being answered.

It is with research inside the medical school—with its relations to teaching and the medical student—that the present article will deal.

IMPORTANCE OF RESEARCH IN MEDICAL SCHOOLS

The reason why research is important within the medical schools is, in a word, that research and teaching constantly react favourably upon each other.

Research is helped because in teaching hospitals patients are under intensive observation and discussion, not only by highly trained clinicians and pathologists but also by keen-eyed students. In these institutions little that has previously been discovered by modern methods will be missed in any given type of case. There is moreover full facility for special and intricate examinations, and a full advisory service of specialists. There is something more; there is an atmosphere in which any breaking of fresh ground at once awakens keen attention and criticism; it is an invigorating atmosphere in which research is generated and fostered.

The atmosphere is itself influenced by research; research largely creates it. Teaching in such an institute is constantly refreshed and is up to date. Teaching and research feed upon each other; they grow together, establishing in a given school *tradition*, which once established brings continuous and lasting fertility. A school possessed of such a tradition is one in which men with progressive ideas tend to congregate; in which there is always a group of thinkers and active workers. Such tradition engenders and maintains outside contacts—contacts with departments of ancillary science, with progressive clinical and pathological departments of other schools, with notable workers and departments of work in all parts of the world. It brings to the school possessed of it many facilities, intellectual, practical, and even financial, which other schools do not enjoy. It is hardly possible to exaggerate its importance; the right tradition is a priceless asset. Without research a teaching school takes the standing of a school of technology.

There is another reason why research must be strengthened within the medical schools. It is imperatively necessary to future medical education that teaching should gain in accuracy and in simplicity; the collection of so-called factual knowledge has in every direction far outdistanced its sifting, from the first standpoint, and its sorting into generalisations, the second standpoint. Medicine has thus largely to be rewritten; an intimate digestion always precedes easy assimilation. We require new books written on these lines, and books fashioning the philosophy of medicine. They can be written satisfactorily only by those whose minds are long trained in criticism and discrimination and who are also experienced in teaching; they should be written as one of the early and chief tasks of the new professoriate.

The kind of research peculiarly suited to teaching hospitals, with their associated schools of final work, is *Clinical Science* in its broadest sense—namely, the branch of knowledge that centres upon diseased human beings, but which also includes directly relevant parts of the allied sciences. In the centre of this field is the human patient, and here the work is upon the living man; but relevant to this clinical work is that of the remaining great departments of pathology—namely, experimental medicine, morbid anatomy, clinical pathology, pathological biochemistry, and bacteriology. Strictly speaking there is between clinical science and *human* pathology, using each of these terms in their broadest senses, no difference. Clinical science tends, however, to be associated especially with work that centres upon the wards, and human pathology upon the adjoining laboratories and post-mortem room. But if we think of wards as laboratories—and from the standpoint of research they are—then no clear theoretical distinction remains. In practice, because pathology (so called) is confined to laboratories, it concentrates less upon the problem in man, and develops comparative and basal studies, such as animal pathology and the natural history of micro-organisms.

These preliminary considerations lead us to regard research in medical schools as a whole, and not purely from the standpoint of clinical or of pathological department. It is essential to full success that the several or many departments of research should work in unison, always maintaining contacts and often joining in combined work. There should be freer interchange between junior personnel of clinical and pathological departments than is now practised; some might profitably work in both departments.

QUALIFIED RESEARCH WORKERS

Research departments (clinical or pathological) should be controlled by the professoriate. The professor should be responsible for the finances, nominate all workers in the department, and allot them facilities. In schools that enjoy additional departments specially endowed for research, the director should control the finances and work of his own department. Members of the teaching staff on the vocational side should be provided with facilities and expenses, should they desire to prosecute researches on their own responsibility.

Research should be led by the professor, while engaging in work upon problems of his own choice. Often he will form a small team of men, recruited from students, younger qualified men, and postgraduates coming from other institutions at home and abroad. His senior assistant should in general work at independent problems.

Encouragement of research should be a particular duty of the professoriate. As previously indicated, promising students will be watched closely; but these cannot spend much time at research before qualifying. Some qualified men will desire regular research work. Prewar experience showed unequivocally that, given the prospect of proper facilities for work and of future full-time appointment, there is no dearth of recruits for research work. There was a notable increase in the number of able young men insistent upon full-time work and mainly research. Many of the ablest were strongly disinclined to contemplate careers in practice. They were aware of fascinating and progressive work to

* Parts I and II appeared in previous issues of THE LANCET.

MR. BUXTON: *Bibliography (continued)*

19. Hepburn, H. H. (1918) *Ibid*, ii, 338.
20. Hickson Surgical Report, South Africa, p. 203.
21. Hunter, J. (1837) J. F. Palmer's edition of his works, London, vol. i, p. 449.
22. Judd, J. R. (1918) *Surg. Gynec. Obstet.* **26**, 139.
23. McWilliams, C. A. (1919) *N.Y. med. J.* **109**, 1024.
24. — and Hetzel, W. B. (1919) *Ann. Surg.* **70**, 257.
25. Metcalf, C. R. (1919) *Ibid*, **69**, 318.
26. Monsarrat, K. W. (1918) *Brit. med. J.* i, 311.
27. Moynihan, B. (1917) *Boston med. surg. J.* **177**, 717.
28. Ogilvie, W. H. (1917) *Brit. med. J.* ii, 280.
29. O'Reilly, A. (1919) *Interst. med. J.* **26**, 7.
30. Page, C. M. (1917) *Brit. med. J.* ii, 282.
31. Paré, A. (1579). The works of that famous chirurgeon, Ambrose Parey, translated in 1665 out of Latine and compared with the French by Tho. Johnson, London.
32. Pool, E. H. and Jopson, J. H. (1919) *Trans. Amer. surg. Ass.* **37**, 61.
33. Quick, B. (1918) *Med. J. Aust.* i, 469, 487 and 510.
34. Reyher, C. (1879) Volkmanns Sammlung, No. 142–143.
35. Speed, K. (1918) *J. Amer. med. Ass.* **70**, 918.
36. Spencer, C. G. (1909) Gunshot Wounds, London.
37. Tatlow, E. T. (1918) *Brit. J. Surg.* **5**, 462.
38. Webber, H. W. (1920) *Med. J. Aust.* ii, 568.
39. Willems, C. (1917) *Bull. Acad. Méd. Paris*, **77**, 394.
40. — (1917) *Bull. Soc. Chir. Paris*, **43**, 1784.

do in relation to human disease and that they possessed the capacity to achieve success in this. At the outbreak of war this country possessed the most promising group of young clinical research workers that it has ever possessed.

The subject of research should usually be chosen by the young worker himself, the head of the department advising upon its feasibility, and exercising an interest and stimulating control. The worker once started should be given all reasonable facilities, and increasing assistance, manual and otherwise, as his work develops.

All such workers in a medical school should have routine duties, preferably in teaching, so that they may not become completely absorbed in research nor completely dependent for their contentment upon results won. The young worker's future career should come up automatically for discussion at intervals of not more than 12 months. Many men who start to do research will not succeed, others will succeed in a measure which does not justify their continuing. For some years it may not be clear whether a particular man is best adapted to research, to teaching, or to practice. Thus it is very important that the system should be flexible, so that he may come to follow his proved rather than suspected aptitudes. No man is prudent in concentrating all his thoughts upon research, or in pledging himself to a research career, before his work is receiving clear recognition from recognised authorities outside his own school. Heads of departments should raise this point, and discuss it frankly from the standpoint of the worker's advantage, on appropriate occasions. The decision finally to embark on a research career should always be the man's, but he is entitled at this stage to know how his work is being assessed by others.

When a worker has proved his research ability, has chosen research as a career, and has been accepted for such, he should be given reasonable security in this career. This means that he must be able to see before him the prospect of increasing facilities and responsibilities, provided by appointments, until he reaches a level where his abilities find full scope and where his remuneration is adequate.

The number of posts available to full-time research workers, within a medical school, will be limited, and especially the more permanent senior posts. It is important that the medical schools should be a recognised breeding ground for men, who should at first be financed, and later on suitable occasion moved to pure research departments (clinical or pathological), by the Medical Research Council and other bodies controlling research. Such coöperation would be to the mutual advantage of schools and such bodies.

RESEARCH ON MAN AND ITS LICENCE

It will be agreed that if real progress is to be made in the study of human disease, the observational method of the ward and of the post-mortem room will not suffice. It is essential to progress that patients should be tested. Especially does this apply to research upon the manifestations of disease, which it may be requisite to reproduce under known and controlled conditions, upon the cause of disease, and upon new forms of treatment that come to trial. Now this must be recognised for what it is—namely, experimentation; the purpose of such experimentation is usually to elicit information of value to the science, and thus to benefit patients in general; it often—but by no means always—elicits information of immediate benefit to the actual patient.

Manifestly no test is justifiable which adversely affects the subject of it. This is a matter which deserves and requires adequate safeguards. The most important safeguard is a proper sense of responsibility among those concerned. Responsibility should rest primarily upon the head of the department engaged in research, whether the test is made by the head himself or by a member of his staff, and no test other than those of a class generally regarded as producing at the most a temporary discomfort should be undertaken without full previous discussion, and without reasonable grounds to believe that it is in the patient's own immediate interest. The touchstone may often be that all parties concerned are willing to submit to the same test. It goes without saying that the fully informed patient should be a consenting party.

RECRUITMENT OF WORKERS AND ORGANISATION OF RESEARCH

It is of first importance to understand that successful research depends upon the men engaged in it. This principle receives frequent lip service, but it is insufficiently ingrained in discussions and actions relating to the promotion of original work. Corporations may plan, panels of medical men may scheme, the charitably inclined and public funds may provide elaborate facilities; but if the wrong man is chosen, or the right man is chosen and put to the wrong ad-hoc job, the whole comes to nought. Meanwhile in some cupboard of a place, ill equipped and unfinanced, his mind fanatically centred on a problem of his own choice, a man hitherto unsuspected of the gift, reveals important truths. That is not to say that men should be put to work in cupboards or starved of equipment. But it throws the emphasis where it belongs, as it would not be thrown if this section were written under the caption "Organisation of research and recruitment of workers." Recruitment should take precedence and organisation proceed to meet the needs of worker as these arise; that should be the almost invariable principle. The usual failure of ad-hoc organisation, other than as it affects work farther exploring original discoveries, is very widely recognised; yet these schemes continue to be frequent.

Many quite legitimately doubt if organised research is not a mistake. Unquestionably it has led to a flood of second-rate and third-rate work and writing. And here it is to be noted that a flood of such work is often not merely unproductive, it may be very harmful in obscuring channels of progress. The idea prevalent in the teaching medical institutes of some countries, that a showing of "research" is an obligatory permit of entry to the staff, is foolish. The idea is prolific of rubbishy work and it overlooks the obvious fact that men without aptitude for original work may nevertheless possess wide knowledge and conspicuous powers of discrimination, qualities which go far towards the making of first-rate teachers. The fundamental point is to allow and encourage men to develop their own aptitudes.

Men with the aptitude for research are among the unusually intelligent.; but men of unusual intelligence have not always the flair, neither is the flair always conspicuous till it is proved. The right men are often diffident. How then to recruit research workers? The sound answer is probably that in most instances they should recruit themselves. Most men with a real itch for research will sometimes do a little audible scratching. There must be someone listening for that scratching. Also, since the itch is not spontaneous, a stimulus should be applied. The wisest process of stimulation is probably applied to students collectively, especially to the more intelligent, rather than to students individually. The individual stimulus too often excites an enthusiast; and a wrong choice may be very wasteful to both parties affected by it. The main stimulus should be education; for example, the appropriate display of past work and of present ideas. In addition students should be shown unobtrusively that facilities for work are at hand.

The space of a simple bench and of such equipment as will give a beginner the chance to feel his way in such beginning should be the student's at request. But at this stage encouragement is rarely desirable; most students who accept the chance quickly fade out when they face realities. If they have any real aptitude, they will at least make a showing, and then is the earliest time for active encouragement, by simple discussion and suggestion; but the best men will least need it. The request for such bench facilities, for use in spare time, should be denied at no stage of a student's career; occasional attendances are all that can be expected before qualification, enough to make a beginning or to maintain contact. A student showing obvious promise, but over-eager, should be asked and advised about its effect on his general training.

FACILITIES FOR RESEARCH

Laboratory accommodation, equipment, assistants.—Each professorial department clinical (medicine, surgery, obstetrics) or pathological (experimental, bacteriological, anatomical, biochemical) will require its laboratory or laboratories, and such general equipment as is appro-

priate. But because, in a medical school, different departments will often need similar equipment, economy and efficiency would be served by running much of these services in common. Thus workshop, store of apparatus, kymographion room, operating theatre, animal house, library, should be held in common under proper supervision and care. Even a large common laboratory would often prove advantageous, by providing valuable contacts between workers.

A recurring difficulty in research departments is that activity varies both in quantity and kind; apparatus goes to the shelf and remains out of use often till obsolete, while other departments purchase the same thing.

Similarly assistant staffs, secretarial, photographic and technical assistants, should be pooled in greater or lesser measure. Otherwise an infertile period of one worker may throw several assistants into a state of idleness.

It might be useful to consider, in the metropolis, even central workshops and stores, to provide and service some of the more complex and special apparatus of several or many institutes.

The provision of a corresponding central library would be a great boon to workers, teachers, and senior students, who now waste much time in seeking given volumes in scattered libraries, and collectively are heavily taxed by subscriptions to professional libraries.

Beds and cases for research.—Senior men engaged in research on patients should have beds allotted to them by the professoriate and be made responsible for the care of the corresponding patients. Research upon patients under the care of other medical men is unsatisfactory, because the worker cannot control therapeutic measures, or the time of discharge, either of which may completely upset plans of research. No-one is fit to undertake independent research on patients who is not adequately trained to undertake full responsibility for their care; but the breadth of knowledge required is not that of a general physician or surgeon.

The number of beds a given worker may require varies, but is not great; charge of 6 to 10 patients, whether research is proceeding upon these or not, should never embarrass him. But if the number of beds allotted to research is to be limited, there must be free access to a considerable pool for the purpose of choosing cases for research, and there must be the right to return cases to the pool so as to free beds for new cases coming under investigation. For the same reason admission of cases to research beds should be restricted to patients chosen by the workers.

This matter of the control of research beds must be faced with the seriousness it deserves, and in combination with that arising out of beds required for professional teaching, for the same principle applies to both. The primary purpose is in each case the provision of beds for the work in hand. An adequate number of patients can be provided by setting aside a large service of beds for each professorial unit; but this defeats the principle of freeing the professorial staff from the crippling routine, which the care of numbers of patients renders inevitable. On the other hand, if the number of beds held is small, and these cannot be used at need for the quick turnover of chosen cases, then the work will be crippled in a different but equally disastrous way. A relatively small number of beds, and a large pool behind these, is the obvious plan; but it can work smoothly only by the active coöperation of members of the staff as a whole. With a system allowing of quick turnover when required, there seems to be no reason why the number of bed patients directly under the professor himself (or any one of his assistants) should exceed 10 or 15. A team of professor and several assistants could be in very active work in clinical research and theoretical teaching with a full complement of 30 beds. The reason why large services of unit beds are usually advocated (60 to 100) is that they are intended to serve vocational teaching, which is not the proper work of the professoriate.

In gathering rare maladies or unusual manifestations of disease, it would be of very great benefit if an organisation were developed to serve this purpose; and the same organisation might make the preliminary selection of cases for both research and teaching. Research upon a particular line is often stopped, for weeks, months, or even years, because suitable patients are not readily available. Such temporary stoppage not infrequently brings the work to an actual ending, for interest in this line wanes during the interval and other interests are awakened.

Grants for research.—A basic research grant should be included in the budget of each professorial department, a grant adequate to cover ordinary laboratory assistance and expenses of the professor and one or at most two junior research workers. Departments and institutions showing unusual activity or recruiting an unusual number of workers should obtain further grants, but these must be controlled closely. There will be competition for such extra grants, and heads of departments will not always refrain from exaggerating the merits of workers and of work done under their own control. These extra grants should therefore be decided upon and assessed by an independent committee dealing with all such grants for teaching hospitals; the same committee should in general pay the salaries of supernumerary research workers at teaching hospitals. The Medical Research Council is the most suitable committee to undertake this work.

SUMMARY

1. There are abundant problems calling for research in the hospitals.

2. Research in teaching schools is important because research and teaching react favourably upon each other, together creating the right atmosphere and building up the right tradition.

3. Teaching hospitals are most suited to research in clinical science in the broadest sense (including all branches of human pathology). The work of wards and laboratories should be intimately associated.

4. Research should be led by the professoriate, and encouraged among his junior staff; facilities for research should be provided for vocational teachers desiring them.

5. All research workers should have some routine duties, preferably in teaching.

6. Young research workers should mainly recruit themselves, their careers being closely watched and guided periodically. Any student requiring a bench and simple facilities should obtain such at least temporarily.

7. Research on man must be conducted only under adequate safeguards.

8. The workers should always be allowed to choose their own problems, and facilities should be increased if and as the work develops.

9. Each professorial department will require a research laboratory (or laboratories) and appropriate equipment. Workshop and other accessory services should be held largely in common; so in some measure should secretarial and technical assistance.

10. Clinical research requires usually but a small number of beds to each worker, but such restriction should carry with it control of patients admitted and discharged, and arrangements for collecting and disposing of cases. A professor and several assistants could be in very active work in research and teaching with a full complement of 30 beds, provided he has a pool behind him.

11. A basic research grant should be included in the budget of each professorial department. Additional grants and the salaries of supernumerary research workers should be decided and assessed by an external committee covering all teaching hospitals.

Dr. ALEXANDER LIPSCHUTZ, director of the department of experimental medicine of the Chilean National Health Service at Santiago, Chile, has been awarded the Charles L. Mayer prize for his contribution to knowledge of factors affecting the growth of animal cells, with particular reference to human cancer.

THE follicle-stimulating hormone extracted from the anterior lobe of the pituitary is combined with the luteinising hormone derived from pregnancy urine in the preparation introduced by Parke, Davis & Co. under the name 'Synapoidin.' The combined hormones have a gonad-stimulating effect several times greater than that of the components administered separately in laboratory animals, but it is not yet definitely established that a similar synergism is maintained in man.

EFFECT OF VITAMIN-C DEFICIENCY ON EXPERIMENTAL WOUNDS

TENSILE STRENGTH AND HISTOLOGY

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THE importance of an adequate intake of vitamin C in securing maximum healing of skin wounds has come to be recognised in the last 2 years, but little information is available as yet on the relationship of graded doses of vitamin C to the tensile strength of wounds and there are still observations which need to be reconciled with our present ideas of the relationship of vitamin C to wound healing. For example, Crandon and others (1940) found that even after 3 months on a diet completely deficient in vitamin C a wound in a man's back apparently healed quite well as far as clinical and histological observation was concerned.

The object of the present work is to compare tensile strength of wounds in guineapigs with their histological appearance, as indicated by van Gieson and reticulum staining, in varying degrees of vitamin-C deficiency, and in some animals to compare the amount of total vitamin C in the whole blood with the tensile strength of their wounds.

METHOD

Tests of wound tension were carried out on 52 guineapigs, and in 19 of them histological preparations were also made of the scars. In 14 guineapigs estimations of total blood vitamin C were made.

The wounds were made by a standard procedure. The back of the animal was shaved, and, using full aseptic precautions under ether anæsthesia, an incision ½ in. long was made on either side of the vertebral column about mid-way between the lower border of the ribs and the pelvis. The skin was completely cut through and the edges of the wound were dissected free from the fascia connecting it with the underlying muscle. Each wound was clipped together with three michel clips spaced at equal intervals. The wound and the surrounding skin were painted with 1/1000 acriflavine solution; this was done also on each of the three succeeding days, after which the clips were removed. No wound became obviously infected, though there appeared to be some slight infection of some of the wounds in the completely scorbutic animals. The animals were killed on the seventh day after the operation.

A week before the operation all animals were placed on a scorbutogenic diet (for details, see Bourne 1942a). They were given the following supplements of pure ascorbic acid daily by mouth.

7 9 9	guineapigs received	30·0 mg. 2·0 „ 1·0 „	9 9 9	guineapigs received	0·5 mg. 0·25 „ none

This diet and the various supplements were continued for the week after the operation until the animals were killed, so that by the end of the experiment the animals had been on their scorbutogenic diet and graded doses of vitamin C for 2 weeks. A large dose of ascorbic acid (30 mg.) was given to one set of animals because it takes between 20 and 30 mg. to saturate a guineapig with the vitamin (Kellie and Zilva 1940), and there is some doubt whether saturation with vitamin C is needed to secure optimum wound healing.

A week after operation the animals were killed with ether, and the skin bearing the scars was excised. A strip of skin bearing ½ in. of each scar of each animal was next cut out with a sharp razor blade and tested for the tensile strength of the scar. In 15 of the guineapigs another piece of each scar was fixed in formol saline for 24 hours. Some sections were later stained with hæmatoxylin and van Gieson, duplicates were stained by Masson's trichrome method, and others were stained to demonstrate reticulum by Foot's silver impregnation method.

TESTING TENSILE STRENGTH

Various methods have been used by different workers to estimate the strength of healing wounds.

Harvey (1929) developed a technique of estimating the tensile strength of wounds in hollow viscera by removing them from the body, tying one end and pumping air into the other until they burst, the pressure of bursting being recorded on a revolving drum attached to a sphygmomanometer. Lanman and Ingalls (1937) modified this technique by using a lumbar-puncture needle attached by rubber tubing to a sphygmomanometer. The needle could thus be inserted into the peritoneal cavity or into any hollow viscus and air pumped in until the wound being tested burst. This method with slight modification was used by Localio and others (1943). Howes and Harvey (1929) and Howes and others (1929) have excised wounds and attached them to a standard thread-testing machine; tension was then increased until the wound broke and the tension at which this occurred was recorded. Hartzell and Stone (1942) used a tensiometer for investigating the tensile strength of excised wounds. Jones and his colleagues (1943) used a direct pull on the scar for the same purposes.

The technique used in the present investigation (fig. 1) was similar to that employed by Jones and his colleagues. The piece of skin bearing the scar was suspended by a toothed clip on one side of the scar and weights were hung on a clip attached to the other side until the scar itself broke across. The weight at which this occurred was noted. The scar on each side of the animal was tested in this way and the final figure obtained was the average of both sides.

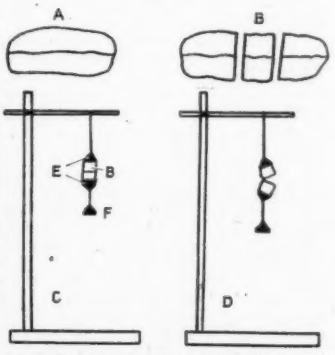

Fig. 1—Technique for estimating tensile strengths of wounds.
A. Excised piece of skin bearing scar.
B. Quarter-inch strip of skin bearing scar cut out from excised skin with razor blade.
C and D. Method of estimating tensile strength. The skin bearing the scar is suspended by a toothed clip from a metal stand. Weights are hung from the toothed clip attached to the other side of the scar until it breaks (see D). E, toothed clips; F, weight.

The technique is not perfect; there was in some animals a considerable difference between the tensile strengths of the scars on each side of the body of the one animal, and individual animals receiving the same dose of vitamin C showed considerable variation in the average tensile strength of their wounds. Nevertheless statistically significant results have been obtained and the method is therefore adequate for the present purpose.

Blood vitamin-C estimations were carried out on 14 guineapigs. With a Record syringe 5 c.cm. of blood was removed from the heart of each animal and placed immediately into a tube containing a mixture of ammonium and potassium oxalate (Heller and Paul 1934). The total vitamin C in the whole blood was estimated by the method of Roe and Keuther (1943).

RESULTS

The results obtained for the tensile strengths of the wounds in the various guineapigs are set out in table I. Hartzell and Stone (1942) found that the tensile strength of wounds 6 days after operation in animals receiving 5 or 10 mg. of vitamin C per day varied between 400 and 600 g. Their figures are higher but of the same order as those obtained in the present experiment. If we compare these means by Fisher's "t" test we find that only two pairs of means do not differ significantly from each other—first the means of the tensile strengths for animals receiving 0·5 mg. vitamin C daily and those receiving 1 mg. of the vitamin, and secondly those for 2 mg. and 30 mg. of vitamin C respectively. The relationship between the means can perhaps be seen more easily in fig. 2. These results suggest that 2 mg. is the optimum amount of vitamin C for securing regeneration of skin wounds in guineapigs, and that, as far as guineapigs are concerned, saturation with vitamin C is not an essential prerequisite of optimum healing.

It was noticed while the tensile strength of the wounds was being estimated that in animals receiving less than 2 mg. of vitamin C per day the skin was softer and

TABLE I—TENSILE STRENGTH IN GRAMMES OF WOUNDS IN GUINEAPIGS GIVEN GRADED DOSES OF VITAMIN C

Each figure is the average tensile strength of two wounds

Dose of vitamin C per day (mg.)

None	0·25	0·5	1·0	2·0	30
0	58	156	111	343	255
0	56	86	143	331	255
46	65	220	231	185	270
21	91	150	120	480	310
55	125	123	95	400	394
0	101	123	150	295	313
21	34	62	96	320	281
34	120	40	135	316	...
50	64	206	158	378	..
Means ±	25·3 ± 7·4	79·3 ± 10·4	118·5 ± 18·0	137·7 ± 13·9	338·7 ± 26·8	296·9 ± 18·5

appeared to be more œdematous. Hartzell and Stone (1942) found the moisture content of the skin of the abdominal wall of normal guineapigs to be 76·1% and that of guineapigs partially deficient in vitamin C to be 79·1%. Vitamin C is known to affect the water metabolism of the body (Abbasy 1937, Evans 1938, Lueg and Hammann 1939), and I have shown in some unpublished work that if large doses of vitamin C are given to rats there is a loss of water from the skin; one would therefore expect an accumulation of water in the skin when insufficient amounts of vitamin C are administered. Doi (1938) has shown that there is an accumulation of water in the tissues in scurvy.

HISTOLOGICAL OBSERVATIONS

Of the 19 animals in which histological preparations had been made of the scars 3 had been on a completely scorbutic diet for the whole period of the experiment (14 days). In these there was complete growth of the surface epithelium over both wounds in each animal. Examination of the fascial scars showed many cells. In some sections large blood-clots showing little or no sign of organisation could be seen (fig. 3). Other parts of the scars were also very cellular and showed only a small development of collagen. These conditions were also observed in vitamin-C deficient animals by Hunt (1941). In some of the scars a few thick strands of collagen which stained deep red with van Gieson could be seen winding through unabsorbed blood-clots. A considerable proportion of the fibres present were of a reticular nature. This was so also in the fascial scar which underlay the panniculus carnosus muscle. The average tensile strengths of the two wounds in each of these 3 animals were 34 g., 46 g. and 21 g.

Three of the animals receiving 0·25 mg. of vitamin C daily were used for histological observations. In one of these although the epithelium had grown across the surface of the scar, there was no union of the subcutaneous tissues beneath it. As a result a large space was present immediately beneath the epithelium (fig. 4). In another animal in this group large numbers of unabsorbed red blood cells were present, permeating the whole of one of the scars. In the third animal there was only a small development of connective tissue in either scar. There were fewer reticular fibres in the scars of all these 3 animals than in those receiving no vitamin C and rather more mature collagen appeared to be present. The average tensile strengths of the wounds in the 3 animals were 34 g., 120 g. and 101 g.

Three of the animals receiving 0·5 mg. of vitamin per day were used for histological observations. In one of these the scar on one side of the animal had not healed superficially at all. The epithelium had not grown across and there were no signs of union of the subepithelial tissues. The wound was covered by a thick scab. There was a deep fascial scar, however, which contained an appreciable number of fibres of which only a relatively small number were reticular in nature. In another animal in this group thick scabs were present (they were more obvious than in the preceding two groups) and the epithelium had grown across the scar. There were many red blood cells and large numbers of reticular fibres in the scar itself. The fascial scar also contained a number of reticular fibres, much more for example than in the firstmentioned animal of this group which was also receiving 0·5 mg. of the vitamin. This is of interest because the average tensile strength of the scars of that animal was 123 g., whereas that of the present animal was only 62 g. (figs. 5 and 6). This fact has two implications. First, that the tensile strength of a wound is dependent, other factors being equal, on the relative amounts of reticulum present in the scar; this confirms Hunt's (1941) observation. Secondly, that the tensile strength is mainly due to the strength of the fascial scar, as stated by Bartlett and others (1942).

In the scars of the 3 animals receiving 1 mg. of vitamin C which were used for histological purposes there was considerable variation in healing. In 2 of them healing was fairly good. In the third a considerable number of unabsorbed red blood cells were still present in the scars, which also contained a large number of reticular fibres. The average tensile strength of the wounds in this animal was 96 g. In the 2 others the fascial scar was thin and contained less reticulum, and the

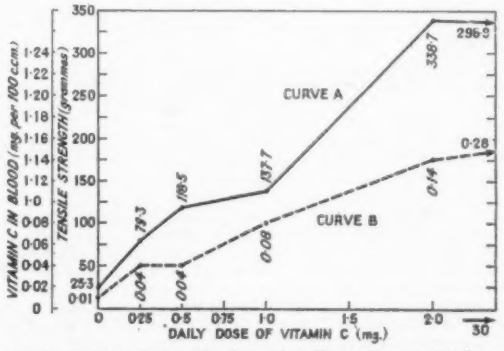

Fig. 2—Curve A, tensile strengths of wounds in 52 animals on varying doses of vitamin C. Curve B, total blood vitamin C in 14 guineapigs on varying doses of vitamin C.

average tensile strengths of their wounds were 135 g. and 158 g. (figs. 7 and 8).

The wounds of 4 of the animals receiving 2 mg. of vitamin C were examined. Well-formed, very fibrous scars containing only a small amount of reticulum were present in each. The average tensile strengths of their wounds were 185 g., 320 g., 316 g. and 295 g. (see figs. 9 and 10). In the animal in which the average tensile strength of the wounds was 316 g. no reticulum at all could be seen in the scars and very little was present in the 320 g. animal. A small amount of reticulum was present in the scars of the other animal.

Scars of 3 of the animals which had been receiving 30 mg. of vitamin C a day showed very little reticulum but were just as fibrous as those of the 2 mg. group. The tensile strengths of their wounds were 270 g., 281 g. and 313 g., so that the small difference in the amount of reticulum in the scars of this and the preceding group of animals evidently has no significant effect on the tensile strengths.

VITAMIN C IN BLOOD

The results given in table II were obtained for the estimation of total vitamin C in whole blood. The individual figures are compared with the average tensile strengths of the skin wounds in the same animals. The error of estimation in this technique is approximately ± 0·02.

There are only 2 animals in each group (except the 0·5 mg. and the 2·0 mg. group) and since in addition there is a fairly large variation in the results for some groups only limited conclusions can be drawn from these figures. Nevertheless it appears that in animals in which the blood vitamin C is less than 0·1 mg. per 100 c.cm. the tensile strength of the wounds is low, and that saturation of the animal with vitamin C, although it increases the value for the vitamin in the blood over that of the animals receiving 2 mg. of vitamin C, does not increase the tensile strength of the wounds.

DISCUSSION

One important fact which emerges from these experiments is the close relationship between the amount

TABLE II—RELATION OF TENSILE STRENGTH OF WOUNDS TO BLOOD VITAMIN C

Daily vitamin C (mg.)	Tensile strength of wounds (g.)	Total blood vitamin C (mg. per 100 c.cm.)
	Av.	Av.
30	255, 394 } 325	0·26, 0·29 } 0·28
2·0	480	0·21
2·0	400 } 392	0·07 } 0·14
2·0	295	0·14
1·0	120, 150 } 135	0·04, 0·12 } 0·08
0·5	123	0·03
0·5	150 } 132	0·05 } 0·04
0·5	123	0·03
0·25	91, 125 } 108	0·06, 0·02 } 0·04
none	21 } 38	0·01 } 0·01
none	55	0·01

of pre-collagen present, the dose of vitamin C given to the animal and the tensile strength of the wound. Thus they completely confirm Hunt's observations. Another important fact is that the scars of some of the animals on the lower dose of vitamin C were similar in general histological appearance, after staining with hæmatoxylin and van Gieson or Masson's trichrome stain, to those of other animals receiving a bigger dose and in which the tensile strength of the wound was much greater. Reticulum preparations of these scars showed more reticulum in the scars of the animals on the lower dose, but in some cases this was the main histological difference between the scars.

Crandon, Lund and Dill (1940) found that, in a man on a diet completely deficient in vitamin C for 3 months, during which the plasma vitamin C had been nil for 44 days, a wound, by the usual histological criteria, showed good healing 10 days after it had been made. There appeared to be abundant intercellular substance and capillary formation. The present work has shown that wounds in animals which are receiving different doses of vitamin C may be very similar in general histological appearance but may have very different tensile strengths. In one case, for example, two animals, one of which had been on 1 mg. of vitamin C for a fortnight and the other on 2 mg., had scars which looked much alike when stained with hæmatoxylin and van Gieson—in fact the scar from the 1 mg. animal appeared to have healed better than that of the 2 mg. animal. The tensile strength of the first, however, was 135 g. and that of the second 320 g. Reticulum preparations showed more reticular fibres in the scar of the former animal. This suggests that although the wound mentioned by Crandon and his colleagues appeared satisfactory from a histological point of view it might have had a low tensile strength.

The period taken for complete breakdown of wound healing in their experiments was 6 months, which may seem an exceedingly long period. If we assume the average life of a human being to be 70 years, the period of 6 months bears to it a ratio of 1 : 140. In a guineapig complete failure of wound healing can be observed after the animal has been on a completely scorbutic diet for 2 weeks. A guineapig's life is only about 3 years; these two periods thus give us a ratio of 1 : 78. So that, even allowing for the guineapig's greater relative requirements for vitamin C, it is not unexpected that a human being should take 6 months to show complete failure of tissue regeneration on a scorbutogenic diet. But we rarely have to deal with human beings who have failed to take any vitamin C at all. Human vitamin-C deficiency where it exists is more likely a small, probably subclinical, deficiency extending over a long period.

The greatest difficulty in this work is to secure a proper basis for comparison of guineapig doses of vitamin C with human requirements. A guineapig needs about 20 mg. of vitamin C for saturation and a human being about 30–40 mg. (Kellie and Zilva 1939). Daily doses of 30 mg. of vitamin C to guineapigs failed to improve the tensile strengths of wounds over those of guineapigs receiving 2 mg. Jones and others (1943) found no significant difference between the average tensile strengths of wounds in animals receiving 1·5 mg. of vitamin C daily and those receiving 15 mg. It is apparent therefore that saturation with vitamin C is not essential for optimal healing, at least of small wounds in the skin, but Jones and his colleagues found that maximal saturation of tissues with vitamin C helped to provide optimal resistance of the tissue to infection. Based on the figures for vitamin-C saturation, human requirements for the vitamin appear extremely small, but based on the minimum requirement to give protection from scurvy (see Bourne 1942a) a human being requires 40 mg. of the vitamin to secure adequate regeneration of bone, and

Fig 3—Unorganised blood-clot in the wound of an animal receiving no vitamin C. Masson trichrome stain (× 100). After a week's healing. Tensile strength of wound 46 g.

Fig. 4—Wound in an animal receiving 0·25 mg. of vitamin C daily. Stained with hæmatoxylin and van Gieson (× 50). Very little scar tissue is present and few fibres have been formed. Although the surface of the wound is covered by epithelium it can be seen that a large empty space is present beneath the epithelial layer. Tensile strength of scar 34 g.

Fig. 5—Wound in an animal receiving 0·5 mg. of vitamin C daily. Stained with hæmatoxylin and van Gieson (× 50). A well-marked difference can be seen between the normal connective tissue of this animal and the scar tissue. This is due to the small amount of fibres and large numbers of cells present in the scar. The epithelium can be seen to have covered the scar completely. Tensile strength of scar 62 g.

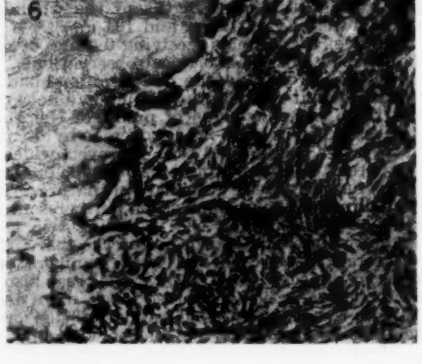

Fig. 6—Reticular preparation of wound shown in fig. 5 (× 120). Numerous reticular fibres and cells can be seen in the scar on right. Normal connective tissue can be seen on the left.

this probably applies also to regeneration of skin wounds. Both the skin and bone wounds used on these experimental animals have been small, the bone injuries being extremely small (1 mm. holes in the femur), and it seems possible that extensive injuries might require much more vitamin C for optimal healing.

The healing of a wound is an emergency process in an animal and one would expect reserves of necessary substances in the body to be called on for this purpose. This appears to be so for vitamin C, since Lauber and Rosenfeld (1938) have shown that if animals are on a low vitamin-C diet the organs lose most of their vitamin C when the animal is wounded and the vitamin can be demonstrated in the tissues surrounding the wound. Presumably there is an increased demand and mobilisation of vitamin C for the healing process. Lauber and Rosenfeld used the acid silver nitrate method for demonstrating the presence of vitamin C in tissues. (For the specificity of this reagent see Bourne 1936, Giroud 1938, Barnett and Bourne 1941.) Bartlett and others (1942), using more exact quantitative methods, showed that the tensile strength of a scar was proportional to its vitamin-C content. For example, the scars of animals receiving 33 mg. of vitamin C twice daily had on an average 7·64 mg. of vitamin C per 100 g. of tissue and burst at a pressure of 258 mm. Hg. Guineapigs on a scorbutic diet had scars which averaged 0·31 mg. of vitamin C per 100 g. of tissue and burst at a pressure of 127 mm. Hg.

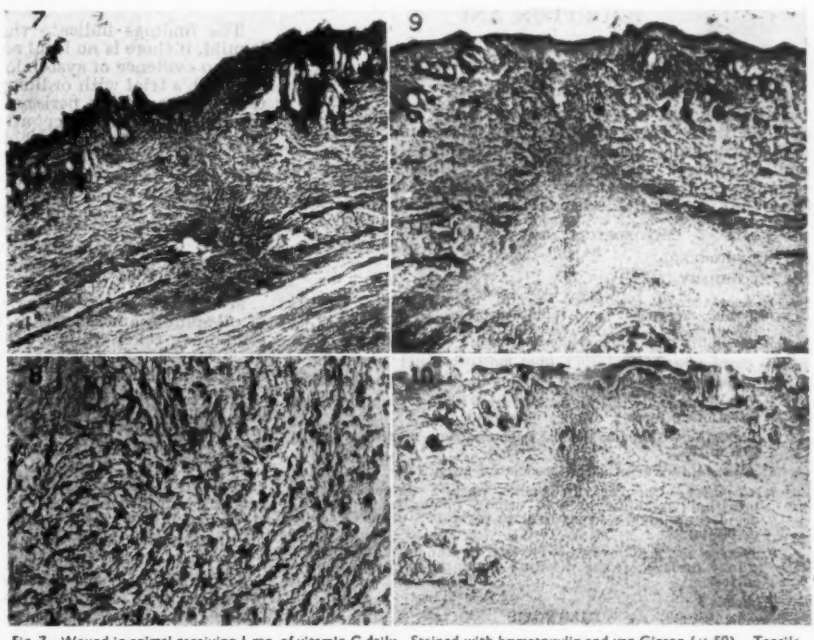

Fig. 7—Wound in animal receiving 1 mg. of vitamin C daily. Stained with hæmatoxylin and van Gieson (× 50). Tensile strength of scar 158 g. This scar contained about the same amount of fibrous tissue as the scar in the animals receiving 2 mg. (figs. 9 and 10) but more of the fibres were reticular in nature. By ordinary histological methods this scar actually looks better healed than that of the animal receiving 2 mg.

Fig. 8—Reticulum preparation of wound shown in fig. 7 (× 120). Numerous fine reticular fibres, but few cells, are present.

Fig. 9—Wound in animal receiving 2 mg. of vitamin C daily. Stained with hæmatoxylin and van Gieson (× 50). There is plenty of collagen in the scar. Tensile strength of wound 295 g.

Fig. 10—Reticulum preparation of wound shown in fig. 9 (× 50). Very few reticular fibres present and intensity of staining of scar tissue similar to that of normal connective tissue.

It is apparent from the concentration of vitamin C in healing tissue that the more extensive the injury the more vitamin C will be required. It seems also since the tissue in greatest need of vitamin C appears to deplete other organs to obtain its requirements, that even if a wound heals fairly well other parts of the body may become deficient in the vitamin, and this suggests that the routine administration of vitamin C to all injured persons would be desirable. Jones and his colleagues (1943) found that the vitamin-C content of the scar and its tensile strength in guineapigs varied with the intake of ascorbic acid. They used however only three levels of intake—0·0, 1·5 mg. and 15 mg. daily. They also observed that the application of sulphanilamide powder did not affect the wound's tensile strength or its content of vitamin C.

Although Crandon and others found that a wound still appeared to heal well from a macroscopical and histological point of view in their human subject after the plasma vitamin had been nil for 44 days, Bartlett and his colleagues (1942) found that wounds in patients whose plasma vitamin C was less than 0·20 mg. per 100 c.cm. had a low tensile strength. Wolfer and Hoebel (1940) had previously shown that in patients with a low plasma vitamin C wounds healed slowest. Hartzell and Stone (1942) found that in guineapigs on a diet deficient in vitamin C wounds did not heal well. They found a low plasma vitamin C in these animals. These results are in accord with those of the present work in which it was found that in most cases a low value for the vitamin C in whole blood resulted in poor tensile strength of wounds.

SUMMARY

The tensile strengths of wounds which had healed for a week were estimated in 52 guineapigs which had been receiving graded doses of vitamin C for a fortnight. In some animals histological examination of the scars and in others estimation of total vitamin C in whole blood were carried out.

The tensile strength of the wounds was found to vary with the daily dose of vitamin C given. Saturation with the vitamin was found not to be essential to optimal healing.

The general histological appearance of wounds (by normal staining methods) did not necessarily give any indication of their tensile strength. There were more reticular fibres in the wounds which had a low tensile strength.

There was a correspondence between total blood vitamin C and wound tensile strength, and when the blood vitamin C was less than 0·1 mg. per 100 c.cm. a wound was likely to have a very low tensile strength.

I am indebted to Roche Products Ltd. for a supply of vitamin C, and to Miss E. B. Cheek and Mr. Brian Lloyd of the Oxford Nutrition Survey for assistance in the collection of blood and for carrying out the estimations of vitamin C.

REFERENCES

Abbasy, M. A. (1937) *Biochem. J.* **31**, 339.
Barnett, S. A. and Bourne, G. (1941) *J. Anat.* **75**, 251.
Bartlett, M. K., Jones, C. M. and Ryan, A. E. (1942) *New Engl. J. Med.* **226**, 469 and 474.
Bourne, G. H. (1936) *Anat. Rec.* **66**, 370; (1942a) *J. Physiol.* **101**, 327; (1942b) *Lancet*, ii, 661.
Crandon, J. H., Lund, C. C. and Dill, D. B. (1940) *New Engl. J. Med.* **223**, 353.
Doi, J. (1938) *J. orient. Med.* **28**, 25.
Evans, W. (1938) *Lancet*, i, 308.
Giroud, A. (1938) L'acide ascorbique dans la cellule et les tissus, Berlin.
Hartzell, J. B. and Stone, W. E. (1942) *Surg. Gynec. Obstet.* **75**, 1.

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PRURITUS ANI

A PRACTICAL APPROACH

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PRURITUS ANI is a symptom of many diseases, as is evident from the ætiological classification. All cases of pruritus ani fall into two great groups—cryptogenic and secondary. Actually, of course, all cases must be secondary; "cryptogenic" is a temporary label for those that at present elude exact ætiological classification.

ÆTIOLOGICAL CLASSIFICATION

(A) CRYPTOGENIC.

(B) SECONDARY.

1. *Local rectal conditions.*—Rectal constipation; fissure; fistula; cryptitis and papillitis; proctitis. Mechanical (traumatic), chemical, and bacterial factors, with later possibility of allergic and psychogenic complicating factors.
2. *Psychogenic.*—Hysteria; anal masturbation; psychosis.
3. *Traumatic.*—Scratching; rubbing of clothing (mechanical).
4. *Allergic.*—Sensitization to bacterial toxins, fungi, or focal infections; foods; drugs; eczemas.
5. *Parasitic.*—Threadworms; trichomonas; monilia; fungi; itch mites.
6. *Thermal.*—Warmth and associated sweating.
7. *Chemical.*—Chemical in badly washed diapers (infant pruritus); alkaline or acid urine; medications; sweat; urine containing calcium oxalate crystals; urine of senile dribbling.
8. *General metabolic causes.*—Thyroid dysfunction; diabetes; kidney disease; liver disease; anæmia; vitamin deficiencies.
9. *Reflex?*

DIAGNOSIS

A familial or personal history of allergy, or the appearance of pruritus after the ingestion of certain foods or drugs, may be elicited. Nocturnal pruritus, particularly in a child, should suggest the possibility of threadworm infestation. A history of "athletes foot" demands fungus scraping of the perianal region. An elderly patient may tell of urine dribbling, an important factor in senile pruritus ani. A local cause may be shown by a history of rectal bleeding, pain with bowel movement, or purulent anal discharge. The history may provide the clue to a systemic condition, the polyuria, polydypsia and polyphagia of diabetes, or the nervousness, warmth intolerance and weight-loss of thyroid dysfunction. Hysteria, anal masturbation or psychosis may be indicated by the history.

Many cases are prolonged by ill-advised local medication, and local dermatitis medicamentosa is not uncommon. The severity of the pruritus is easily evaluated by the type of therapy previously employed. If the patient continues to present severe pruritus after oil-soluble anæsthetics by injection, after roentgen therapy, or after a subcutaneous neurotomy, he has pernicious pruritus ani, and must be given immediate relief.

A complete physical examination will point the way to further laboratory examinations, such as a basal metabolism test, a complete blood-count, urine analysis or blood-sugar determination. Local rectal examination may reveal ulcer, fistula, or external hæmorrhoids. Digital examination may establish the presence of acute ulcer spasm, hypertrophied papillæ, anal or lower rectal tumour mass, or rectal constipation. Sigmoidoscopy and rectoscopy will disclose any disease in these regions.

TREATMENT

The findings indicate the therapy. If the pruritus is mild, if there is no local rectal or sigmoid abnormality, and no evidence of systemic disease, the patient is given a month's trial with ordinary hygienic measures. He is told to cleanse the perianal area carefully with cotton-wool and warm water after every bowel movement and at bed-time, and to dry it carefully and powder with corn-starch or talcum powder on a powder puff. No local treatment, either by lotion or salve, is prescribed.

If local abnormality is discovered—e.g., fistula, fissure or hæmorrhoids—surgery is advised. The patient is forewarned, however, that this may not relieve the pruritus and that further treatment may be needed.

Moderately severe cases may require local injection of oil-soluble anæsthetics. These may be employed for temporary relief while a more complete investigation is in progress. I never recommend roentgen therapy. Fungus infections are treated with half-strength Whitfield's ointment or, more recently, with a solution of 50% camphor and 50% phenol, painted on the peri-anal area twice a day. We need not here discuss the therapy of pinworms or of systemic disease.

Severe cases must be given immediate relief, and extensive diagnostic studies should await this relief rather than precede it. If there is no local disease in the lower bowel and if the usual local measures, including oil anæsthetics, have already been unsuccessfully tried, I advocate tattoo or tattoo-neurotomy.

Anæsthesia for this procedure may be local infiltration, preferably with an oil-soluble anæsthetic to obviate post-tattoo discomfort; 20–30 c.cm. of solution, carefully injected to prevent pooling, is usually adequate. The perianal area is then coated with an ointment, such as lanoline, 'Nupercainal' or carbolated soft paraffin, to hold the dye particles during tattooing. The dye employed is cinnabar (mercuric sulphide), made into a heavy paste with water, alcohol, solution of merthiolate or procaine. The tattoo instrument has a speed of about 3000 vibrations per minute and employs 8–10 fine needles, set in a single row and adjusted to penetrate to a depth of 2 mm. The needles are dipped into the dye mixture from time to time while tattooing, and are held against the perianal skin at an angle of 45°. The skin must be kept under tension, while the instrument is used with a back-and-forth or rotary motion. The resulting tattoo should be smooth and uniform.[1]

Tattooing with cinnabar has been effective in a large proportion of my cases. I believe it to be preferable to alcohol injection which requires a long stay in hospital and leads to unpleasant sloughing. My experience with tattoo therapy in 32 cases of pernicious pruritus ani has been most satisfactory. It is a consulting-room procedure, simple, ambulatory and rapid. More recently I have performed a combined tattoo and subcutaneous neurotomy with excellent results in 21 cases, and I believe this procedure to be more satisfactory than either tattoo or neurotomy alone. This operation, too, may be performed under local anæsthesia in the consulting-room, though I prefer to keep the patient in hospital for a day and to give low spinal anæsthesia for the operation.

SUMMARY

Diagnosis and therapy in pruritus ani call for a complete history and physical examination, as well as local rectal study.

Therapy will vary with the cause but tattoo-neurotomy is the procedure of choice in cryptogenic pernicious pruritus ani.

1. Cantor, A. J. *Amer. J. Surg.* 1941, **53**, 121.

DR BOURNE: *References (continued)*

Harvey, S. C. (1929) *Arch. Surg.* **18**, 1227.
Heller, V. G. and Paul, H. (1934) *J. Lab. clin. Med.* **19**, 777.
Howes, E. L. and Harvey, S. C. (1929) *New Engl. J. Med.* **200**, 1227.
— Sooy, J. W. and Harvey, S. C. (1929) *J. Amer. med. Ass.* **92**, 42.
Hunt, A. H. (1941) *Brit. J. Surg.* **28**, 436.
Jones, C. M., Bartlett, M. K., Ryan, A. E. and Drummey, G. D. (1943) *New Engl. J. Med.* **229**, 642.
Kellie, A. E. and Zilva, G. G. (1940) *Biochem. J.* **33**, 153.
Lanman, L. H. and Ingalls, T. H. (1937) *Ann. Surg.* **105**, 616.
Lauber, H. J. and Rosenfeld, W. (1938) *Klin. Wschr.* **17**, 1587.
Locallo, S. A., Casale, W. and Hinton, J. W. (1943) *Surg. Gynec. Obstet.* **77**, 243.
Lueg, W. and Hammann, G. (1939) *Med. Welt.* **13**, 116.
Roe, J. H. and Keuther, C. A. (1943) *J. biol. Chem.* **147**, 399.
Wolfer, J. R. and Hoebel, F. C. *Surg. Gynec. Obstet.* 1940, **69**, 745.

CANCER CONTROL ORGANISATION FOR EDINBURGH AND SOUTH-EAST SCOTLAND.—The executive committee, at a meeting held in Edinburgh on May 3, discussed the part the organisation might play in the future cancer service, the publication of studies on mammary cancer, and the fuller use by medical practitioners of travel vouchers to enable patients to attend at Edinburgh Royal Infirmary for treatment or examination free of charge. The treasurer of the organisation is Prof. William Annan, CA, 22, Charlotte Square, Edinburgh.

TISSUE CULTURE OF MALARIA PARASITES (*PLASMODIUM GALLINACEUM*)

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THIS note is a preliminary report on the cultivation of the exo-erythrocytic stages of *P. gallinaceum* by the technique of tissue culture. As is well known, malaria parasites go through an asexual cycle in the erythrocytes of their vertebrate host (man or bird), thus furnishing the forms which are commonly found in the blood, and a sexual cycle in the invertebrate host, the mosquito. In addition, *P. gallinaceum* and certain other avian plasmodia exhibit forms which develop in reticulo-endothelial cells and in the capillary endothelium of the brain and other organs, these forms being known as exo-erythrocytic forms (James and Tate 1938). The relation of these forms to the development of sporozoites and to the production of relapses is a matter of dispute. The occurrence of similar forms in human malaria has not yet been satisfactorily demonstrated.

No-one has yet succeeded in cultivating the blood forms (trophozoites) of malaria parasites in vitro for an indefinite period, although Trager (1943) has improved the technique available for this purpose, and has observed living parasites after maintenance at 40–41° C. for 15 days. Since the exo-erythrocytic forms of *P. gallinaceum* live in cells which can easily be grown by the standard methods of tissue culture, it was considered that in vitro cultivation of these stages might present fewer difficulties. Previous work on this subject has been described by Gavrilov, Bobkoff and Laurencin (1938) and by Hegner and Wolfson (1939). Gavrilov and his colleagues made numerous experiments in which tissue from fowls infected with *P. gallinaceum* was cultured in vitro. Malaria parasites were never found histologically in these cultures, but on two occasions material, cultured for 7 and 10 days, produced infections when inoculated into other fowls. Other experiments with inoculation of cultured tissue yielded no infections. Hegner and Wolfson (1939) were primarily interested in attempts to determine whether exo-erythrocytic forms were truly a stage in the life-history of plasmodia or whether they were really a separate species of parasite altogether. They describe a single experiment in which tissue was taken from a canary infected with *P. cathemerium* and cultivated in vitro. After 8 days, material from the cultures was inoculated into fresh canaries and produced typical infection with *P. cathemerium*; material taken at a later date was not effective in producing infection. Exo-erythrocytic forms were seen in smears made from one culture on the 15th day. No further investigation has been reported by these workers.

In the present work, tissue was taken from 20-day-old chicks which had been infected 8 days previously by the intravenous injection of sporozoites. Such chicks die after 8–9 days with great numbers of exo-erythrocytic forms in the capillaries of the brain; similar forms can also be found in smears made from the spleen, marrow, liver and other organs, but often much search is required to demonstrate them.

Tissue from the spleen, liver, marrow or brain was implanted in roller tubes in a mixture of plasma and extract of embryo; and a mixture of Tyrode's solution and embryo extract was added to form the fluid phase as is customary in this technique. Growth of the tissues (except brain) was vigorous. After a few days numerous parasites were found in the cultures of spleen and marrow; in the cultures of liver they were less plentiful.

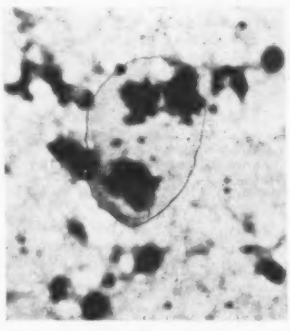

Fig. 4—Photograph of schizont on 15th day of tissue culture. The outline has been marked in ink to increase the distinction when reproduced. (× 2500.)

A detailed description of the forms as they appear in tissue culture will be given in a later publication; for the present it is enough to say that the commonest form is the large oval schizont containing numerous pieces of chromatin. Generally this is found on the slide free from any cell, but it is possible that it is really intracellular and that the remains of the host-cell disintegrate when the tissue is smeared over the slide for microscopical examination. Small mononuclear forms are also fairly common in some preparations. To date, apparently healthy parasites have been found on the 15th day of culture (after which the cultures were overgrown by fibroblasts). Tissue taken from tubes on the 8th day was injected intraperitoneally into chicks which became infected with typical endo- and exo-erythrocytic forms; also fluid taken from several tubes on the 9th day infected chicks after intraperitoneal injection.

It is considered that the conditions permit something more than mere survival of the parasites and that multiplication really occurs in vitro because: (1) parasites are difficult to find in the original implant, but large numbers are found after cultivation for several days; (2) clusters of tiny mononuclear forms are often found, which presumably have been formed by the recent division of a large schizont. Some of these forms are depicted in the illustrations (figs. 1–4). Fig. 3 shows 5 medium-sized schizonts still attached to the remains of the host-cell; possibly the cell was originally parasitised by a plasmodium which divided into 5, and each of the 5 daughter forms continued to multiply in the same site; more probably this multiple infection is the result of invasion by five merozoites. This technique seems to promise interesting possibilities and its study will be pursued.

Fig. 1—Typical malaria parasite (exo-erythrocytic schizont) in tissue culture on 7th day. (× 2500.)

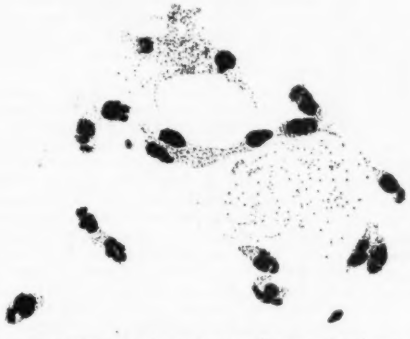

Fig. 2—Division of a schizont into small mononuclear forms; the elongated shape of these forms may be due to distortion during smearing; after 4 days in culture. (× 2500.)

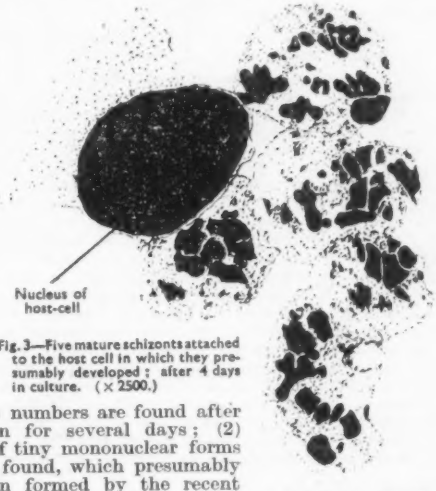

Fig. 3—Five mature schizonts attached to the host cell in which they presumably developed; after 4 days in culture. (× 2500.)

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THE LANCET

LONDON: SATURDAY, MAY 27, 1944

WOUND SHOCK

ON the eve of battle in which he may have to deal with many casualties, the medical officer is probably thinking a good deal about how he is to recognise wound shock and how he is to treat it. It is not difficult to recognise fully developed shock, and in a batch of wounded men the badly shocked can usually be picked out almost at a glance. The characteristic picture is unmistakable: the pale face with beads of sweat on the brow, the alert expression with a tinge of anxiety, restless fidgety movements, insatiable thirst, vomiting shortly after each drink, a cool skin, a rapid and almost impalpable pulse, and a low blood-pressure. This picture denotes profound collapse of the circulation and its urgency must not be underrated. Irregular and sighing respiration is a danger signal, and air-hunger often means impending death. A badly wounded man who is very quiet and still, perhaps with his face swathed in bandages, may be very near death and should be examined at once.

For the medical officer in forward areas a harder problem is to detect the man whose circulation is precariously maintained and is liable to fail suddenly and disastrously under the strain of further evacuation; this is the state of "latent shock" described by Mr. ZACHARY COPE on p. 703. The harassed doctor faced with a difficult decision in a busy and over-filled advanced dressing-station would do well to remember that shock during the first few hours after wounding is usually a result of considerable hæmorrhage or of large wounds (with or without evidence of much blood loss). For practical purposes he need not concern himself further with ætiology. If he notes that dressings, clothing or blankets are grossly blood-stained, or finds much swelling around the wound, or sees that the wound—or the total area of all wounds—is large, with much laceration of tissue, he may assume that shock will develop sooner or later. His job then is to make the man fit for evacuation and to keep him in good condition during transport. Transfusion is required, but complete replacement of lost blood is not always feasible. The great majority of men who are shock-prone, or have moderate shock, travel well after one or two pints of plasma, with a drip-transfusion continued in the ambulance (as described by LUCAS);[1] and this may tide even the severely shocked patient over a dangerous period till he reaches a transfusion unit. Bleeding must be controlled—by large pressure dressings in preference to a tourniquet. Morphine is given, but only as much as is required to relieve pain; and it is best given intravenously. If the man is chilled he should be warmed, but not baked; if heating causes discomfort and sweating it is doing more harm than good. Efficient splinting of injured limbs, especially fractures, and gentle handling at all times, are essential. A convenient order of treatment of the shocked man is to start transfusion, inject gr. ¼ morphine through the tubing near the needle, apply or adjust dressings or splints, making sure that no bleeding is going on, give hot sweet drinks, and make him comfortably warm.

The transfusion officer and the surgeon at rearward units often have to face more complex problems. Failure of the circulation at a later stage after wounding may have many causes. As OGILVIE[2] puts it "for stretcher-side medicine" shock "must be de-defined": a very similar picture is produced by hæmorrhage, plasma loss (in burns and crush injuries), peritonitis, gas gangrene, brain damage, fat embolism, blast injury or any combination of them. Circulatory failure may be aggravated by rough travel or pain, and in this case some spontaneous recovery may be expected with rest and quiet. The cause of the failure cannot always be decided at one examination; it may be discovered only by careful and repeated observation of progress during transfusion. No single criterion will suffice for accurate diagnosis and for assessment of recovery, but serial blood-pressure records are certainly the most useful. The plan then is to diagnose circulatory failure, to start transfusion, and to watch progress. Brain damage and pulmonary complications, which as a rule are easily detected, may render continued transfusion useless or dangerous. The response is often poor and transient in peritonitis and gas gangrene, in which early surgical intervention may save life. But the commonest cause of a poor response is continued or renewed bleeding, especially into body cavities, and here the most gratifying successes can be achieved by immediate operation to arrest bleeding, combined with rapid, and if necessary massive, replacement of blood. Shock from hæmorrhage rarely becomes "irreversible" if it is tackled at once and with determination. Every experienced transfusion officer has seen men die who might have been saved if transfusion had been started only a few minutes earlier, and every experienced surgeon has on occasion operated too late.

At this date it should not be necessary to emphasise that resuscitation by transfusion, and observation of progress, should not end when the patient reaches the operating-table; often they must be continued, and with greater energy, during and after operation. Difficulties in diagnosis and treatment are often most numerous and complex in the postoperative period.

1. Lucas, H. K. *Lancet*, 1943, ii, 503.

THE HÆMOLYTIC STREPTOCOCCUS AND SCARLET FEVER

TEN years or more elapse, they say, before a new discovery is put into practical use. When GRIFFITH divided *Streptococcus pyogenes* into a large number of serological types he enabled bacteriologists to prove what the epidemiologists had long suspected, that the same streptococcus might be responsible for a mixed outbreak of scarlet fever and sore throat, and enlightened physicians like HOBSON[3] urged us to abandon the illogical but time-honoured practice of isolating the case of scarlet fever while leaving the sore throat at large. But to the lay public and to many doctors in practice scarlet fever was still a dangerous disease, and both family and family doctor felt happier when the ambulance had removed the patient

2. Ogilvie, W. H. *Brit. J. Surg.* April, 1944, p. 313.
3. Hobson, F. G. *Lancet*, 1936, i, 417.

to hospital. However, hospital authorities, impressed with the increasing mildness of scarlet fever and the greater need for hospital treatment of measles and pertussis, increased the beds available for the latter infections at the expense of scarlet fever, while progressive medical officers of health like DUNCAN FORBES of Brighton and FORREST of Leyton encouraged with considerable success the home nursing of scarlet fever. Now the Essex Epidemiological Committee has issued a memo (see p. 711) to all local medical officers of health and practitioners advising them not to send scarlet fever to hospital except in certain circumstances—for example, an unfavourable home environment, an approaching confinement, or the presence of a food-handler in the household. The memo does not specify whether under these conditions a patient with streptococcal sore throat should also be admitted to hospital, but it points out the danger of nursing many cases of scarlet fever in one large ward since most of the secondary complications are due to cross-infection with a streptococcus derived from another patient.

Fresh light on the epidemiology of scarlet fever and related streptococcal infections has been cast by recent American work. The studies of SCHWENTKER, JANNEY and GORDON [4] in Rumania established the importance of antibacterial immunity in the individual's resistance to scarlet fever, for they proved that bringing together a scarlatinal streptococcus and a Dick-positive person did not necessarily result in infection. On the side of the parasite, GRIFFITH [5] had earlier noted in his investigations of streptococcal outbreaks in schools that for no apparent reason a particular serological type, perhaps recently introduced, would suddenly begin to spread and produce clinical infection in the community. To do so the streptococcus needs to be endowed with both infectivity or communicability as COBURN [6] calls it and virulence; that is, it must be able to pass readily from one person to another, establish itself in the new environment and produce infection. These two properties do not necessarily go together. An organism may have a poor capacity of communicability but a high virulence, and vice versa. It would be helpful if we had some indication beforehand of the kind of streptococcal carrier who is likely to initiate epidemic spread of infection. In an outbreak of type 19 streptococcal infection (scarlet fever, tonsillitis and pharyngitis) among naval personnel, COBURN obtained some useful information about two patients who became dangerous carriers in that they later initiated fresh outbreaks. Both of them developed secondary complications after their initial infection, in one case mastoiditis and bronchitis, and in the other sinusitis and bronchitis. In both, the throat cultures yielded only small numbers of the epidemic streptococcus. COBURN suggests that in the course of producing secondary complications the infecting organism acquires the capacity of communicability because it has to adapt itself to the changing immunity of the host in order to maintain its activity; in other words it becomes "host-fast." Thus the patient with secondary complications would seem to be a likely focus for the spread of infection, and epidemiological experience gives some support [7] to this hypothesis. COBURN could not discover any distinguishing morphological or cultural features in the streptococci isolated from these two dangerous carriers; other workers claim that a streptococcus in epidemic mood is more likely than not to be capsulated.

Meanwhile, HAMBURGER and his colleagues [8] have confirmed another British experience that serological types of the streptococcus endowed with the erythrogenic toxin differ in different seasons in their capacity to produce the scarlatinal syndrome. Is this due to a variation in the toxigenicity of particular types or to some other acquired variation in the parasite? As COBURN remarks—"The nexus between a host-bacterium interaction . . . can probably best be defined by the collaboration of the clinical epidemiologist, the student of bacterial metabolism and the enzyme chemist."

THE SCIENCE AND THE ART

> "To the physician particularly a scientific discipline is an incalculable gift, which leavens his whole life, giving exactness to habits of thought and tempering the mind with that judicious faculty of distrust which can alone, amid the uncertainties of practice, make him wise unto salvation. For perdition inevitably awaits the mind of the practitioner who has never had the full inoculation of the leaven, who has never grasped clearly the relations of science to his art, and who knows nothing, and perhaps cares less, for the limitations of either."

Sir THOMAS LEWIS has studied for many years the technique appropriate for that inoculation. Fifty years ago, when OSLER spoke those words, the method seemed plain. Germany had pointed the way, by establishing in her medical schools great laboratories of chemistry, anatomy, physiology, and the rest, whose scientific approach and whose new knowledge were permeating all medicine. Let the student in his earlier years pass through the discipline of these laboratory departments and he would reach his clinical stage equipped not only with knowledge of the structure and functions of the human body but also with the habits of exact thought and the judicious faculty of distrust that are so desirable. America and Britain have built those laboratories, and today the student serves long years in them, but it cannot be said that the bulk of practising doctors yet think with scientific precision. Their changing enthusiasms for vaunted remedies of no proved value are proof enough that they are more credulous than critical. Why has the inoculation not leavened the lump?

LEWIS gives his answer, and prescribes his remedy, in the reflections upon medical education concluded in our present issue. The fundamental difficulty, put more bluntly than in his incisive sentences, is that science has not yet justified itself over a wide enough stretch of clinical medicine. By science we mean that precise mode of thought that seeks generalisations and explanations behind phenomena, inquires by experiment, and learns to forecast the consequences of certain acts. If it were as evident to the medical student that medical science could cure most kinds of disease, as it is to the engineering student that engineering science can build most kinds of bridge, then the former would assimilate

4. Schwentker, F. F., Janney, J. H. and Gordon, J. E. *Amer. J. Hyg.* 1943, **38**, 27.
5. Griffith, F. *Spec. Rep. Ser. med. Res. Coun. Lond.* No. 227, 1938, p. 267. 6. Coburn, A. F. *Nav. med. Bull., Wash.* 1944, **42**, 325.
7. See Brown, W. A. and Allison, V. D. *J. Hyg., Camb.* 1935, **35**, 283.
8. Hamburger, M. jun., Hilles, C. H., Hamburger, V. G., Johnson, M. A., and Wallin, J. G. *J. Amer. med. Ass.* 1944, **124**, 564.

and use his science as readily as the latter. But in so much of medicine the physician still merely observes the manifestations of disease, associates them in arbitrary but meaningless recurrent patterns, and is powerless to influence them. Since, as a body, physicians cannot shut their eyes to some of these manifestations and concentrate upon others—for the patients stand before them as human beings asking for help—it is little wonder that their intellectual interest develops along the line of the collector's, and their therapeutic effort often shows more fond hope than discrimination. These physicians become the teachers of clinical medicine, ten or twenty years after they have left the laboratories and the scientific atmosphere. Naturally they teach what they practise—careful observation, skilful technique, the recognition of multifarious patterns of signs and symptoms, and a mixture of treatments good, bad and indifferent; to that the best of them add a human understanding and a measured sympathy that are beyond the comprehension of science. They do not ignore the positive contributions of science to therapeutics, but they are apt to teach them as rules of thumb, to students who are prone to use them clumsily or inappropriately. The empiric in medicine still greatly exceeds that part which science has rationalised; hence a loose empiricism tends to predominate over scientific precision of thought.

And yet it seems likely that science can infiltrate and clarify further reaches of medicine, and that the scientific attitude, informing but not engulfing the art as practised today, will improve the standard of the art's achievement. That proposition, however, is not self-evident to the student and the practitioner; it must be presented and accepted as a matter of faith, in the belief that it will bear fruit. LEWIS'S proposal is that the university professoriate in medicine should become the custodians and teachers of that faith. To that end professors must become more highly differentiated, in the embryologist's sense. They must no longer attempt to be widely experienced all-round physicians. They must leave the teaching of routine medicine—diagnosis, prognosis and treatment—and the management of large wardfuls of patients, to their non-professorial colleagues. They must concentrate on the study and teaching of what, for want of a better term, LEWIS calls "theoretical" medicine. Their task is to show the student what ground science has won in medicine; just how, as a matter of historical fact, it was won: what signs and symptoms can be explained in terms of applied anatomy and applied physiology, and by what means scientific observation and experiment arrived at the explanations; where the boundaries of scientific medicine lie; and what tracts beyond them are ripe for invasion by appropriate scientific methods. To some types of student mind this clear-cut presentation of science within medicine, far more than the present teaching of laboratory science antecedent to medicine, will make a strong appeal. From such minds the future researchers (and the future professors) will be recruited. They must be given opportunity, sparingly in their student years, and abundantly after graduation, to develop for themselves the spirit of critical inquiry and the mental technique of investigation. In the mass of students as seen today they will be a minority. For the rest "vocational" medicine will be their lifework, but they too should be given the discipline of a measured amount of "theoretical" training, in order that they may at least learn discrimination, and go forward with minds still open, able to distinguish between true and false, proven and not proven. The separation of vocational and theoretical training implies no segregation of students; it is designed merely to give the theoretical training more emphasis and more scope. The professor who is to present this aspect of medicine must be himself a researcher and a director of research in that field of experimental medicine dealing directly with the human subject to which LEWIS has given the name clinical science. He must be acquainted with the broad trends of all current investigation bearing on that field. Hence he must be freed from burdens of routine ward teaching and routine care of patients. The wards attached to his department should be small: thirty beds are suggested. The patients should be selected from the whole pool of those available to the hospital, for their relevance to the subjects under investigation or as illustrations of "theoretical" teaching; the professorial unit should be fully responsible for their care, but may return them to the pool at its discretion.

We are looking forward to rapid changes in the near future in the organisation of hospitals and of medical teaching. There is room for experiment and innovation, for while we think that our best achievement in the past has been very good we must admit that our average is capable of improvement. Sir THOMAS LEWIS'S views, backed by a lifework in which he has put them into practice with eminent success, will impress the arbiters of planning very strongly. His objective will be widely approved. His method, we hope, will be widely attempted, but it is probable that even he himself would not wish it to be the only experiment made. Granted that the complexity of the teaching task calls for differentiation of function among teachers of medicine, the differentiation need not always be between professorial and non-professorial units. A "vocational" professor might be combined with a "theoretical" associate, or a "vocational" associate with a "theoretical" professor, within one department, the assistants gravitating according to their bents, or on occasion oscillating. Differentiation is easy to arrange for; integration is equally necessary, but more difficult to achieve. Any scheme will fail if antipathy arises between the teachers or between their teachings, and the student will suffer rather than gain if he senses professorial scorn for the muddle-headed clinician, or the practical physician's faintly contemptuous indifference towards the intellectual highbrows. Sometimes these attitudes may be less likely to develop between members within one department than between separate departments. By more roads than one we may come nearer the goal of grasping clearly the relations of the science to the art, and knowing much of the limitations, and the scope, of both.

AT the request of the Minister of Health the Annual Representative Meeting of the British Medical Association called for July 18 has been postponed until further notice, and the Panel Conference will not be held on June 28. This will have the effect of postponing negotiations on the White Paper.

Annotations

DRUGS UNDER THE TONGUE

TWENTY years ago Grossmann and Sandor [1] proved beyond question that nitroglycerin is freely absorbed from the sublingual space. An official palatable tablet is provided for use in angina pectoris but it is still uncertain whether absorption is rapid enough to bring the drug into action before the attack subsides spontaneously. The later assumption that morphine can be administered with advantage by the same route has been based largely on analogy and perhaps hopeful thinking. Walton [2] has now shown by animal experiment and human controls that unless morphine which is placed under the tongue is subsequently swallowed an amount at least ten times as great as the subcutaneous dose is needed to produce comparable effects. For the relief of pain therefore at least two grains would be required and this might prove dangerous if swallowed. Dihydromorphinone ('Dilaudid') and codeine proved equally ineffective sublingually. Diacetylmorphine (heroin made a better showing with a sublingual/subcutaneous effective dose ratio of five instead of ten to one, but this still seems outside the range of safe therapeutics. Drugs can be classified from this point of view into four groups. First, there are those sufficiently well absorbed in the mouth to be operative in reasonable dosage—e.g., nitroglycerin, apomorphine, cocaine and nicotine—even if some of them, such as ergotamine tartrate, are more effective when swallowed. In the second group are those which are well absorbed but only effective when given in doses which would be dangerous if ingested—e.g., morphine, strychnine, atropine and picrotoxin. Then there are some which though absorbed usefully are either irritant locally, such as pentobarbital, or too insoluble to go into solution in the small amount of fluid available. Last come a large group of drugs which fail to penetrate the mucous membrane or are only taken up at insignificant rates, for example, leptazol, strophanthin, digoxin, ergometrine. The sublingual route may prove valuable for the administration of substances which are destroyed by the ordinary processes of digestion. Thus it has been reported [3] that in Addison's disease adequate amounts of desoxycortone can be introduced in this manner over a considerable period, and posterior pituitary extract, in double the intramuscular dose, is sometimes given in the same way. Several testosterone compounds and œstrogens are also usefully absorbed and so support Walton's thesis that there is a close relationship between the lipoid solubility of a drug and its ability to pass the buccal mucous barrier. The correlation however is not sufficiently close to remove the necessity of investigating the behaviour of each individual substance before relying on sublingual absorption.

TOOTHACHE AND AVIATION

APART from the emotional stresses to which the airman is subjected, three main physical strains are placed upon him—low temperature, low pressure and centrifugal force, the effect of the first two being increased by altitude and the third by tight turns or loops. The possibility of low temperature at high altitude causing dental pain has been greatly overrated and some curious statements have been made, apparently through forgetting that the cheeks, lips, tongue and saliva all insulate the teeth against temperature changes. Thus Koelsch [4] has suggested that the cold is sufficient to make metal fillings contract and fall out. Other writers have suggested that amalgam fillings would disintegrate, perhaps having in mind the fact that tin, which may be used in small quantities in the amalgam, rapidly becomes amorphous at −48° C. The fallacy in these suggestions has been shown by Harvey.[5] Using a thermocouple sealed into a tooth he has demonstrated that when modern oxygen equipment is used the range of temperature recorded is about 20–45° C., well within everyday limits. An iced drink taken at ground level reduced the temperature of the tooth to 12° C., far lower than the lowest temperature recorded for altitude. The deleterious effects of low barometric pressure at great heights have largely been countered by the use of the pressure sealed cabin. At medium or high altitudes, if the flyer is exposed to the fall in pressure, there is no reason why the normal tooth should be affected more than any other organ. "Bends," due to the escape of nitrogen bubbles into the tissues, typically gives rise to joint and muscle pains, or more rarely to nervous signs, and though it may produce dental pain it is unlikely to do so without other symptoms. In a case of diver's bends recorded by Donald [6] the patient had toothache as part of a severe temporary trigeminal neuralgia for which a bubble involving the second branch of the trigeminal nerve was blamed. It is of course possible, in an improperly filled tooth with an air-space over the pulp under a sealed filling, that the change in volume with pressure might give rise to pain, and Restarski [7] has shown by staining methods with extracted teeth that leakage round the margin of a filling takes place more readily under gross changes in pressure if the filling materials are improperly mixed. In a turn or loop centrifugal force is usually acting from head to feet. This is a well-known cause of "blackout" but is unlikely to cause dental pain. A tooth with a slight degree of pulpitis might be made to ache by the increased blood content in the narrow pulp chamber when the centrifugal force acted in the opposite direction, but an aircraft is seldom manœuvred in such a manner. It will be seen then that none of the three main conditions peculiar to flying are likely to give rise to pain in sound teeth. Where however a pathological state already exists, known or unsuspected, flying conditions may exacerbate it, and so draw attention to it. Regular dental inspections and X rays are clearly an important part of the periodical examination of flying personnel, and the rarity of toothache in pilots and air crews on flying duties is a tribute to the efficiency of the RAF dental service.

DUST IN FOUNDRIES

WORKERS in steel foundries, and to a less extent in other foundries, are exposed to the risk of silicosis from inhalation of dust when moulding sand is being cleaned off the metal castings. War has brought with it more casting, more dust, and more risk. Silicosis became a matter of concern in America in the late 'twenties, some 15 years after the increase of foundry activity which began in 1915–1916. A similar increase could no doubt be shown in other steel-producing countries and it is to be anticipated after this war unless active measures are taken to control foundry dust. These and other points are made [8] by Ross and Shaw from their observations in 1942 of conditions in 28 foundries in three Australian States. From 15 foundries they took samples for counting and chemical analyses to determine the dust concentration and type of dust to which the workers were exposed—using the Owens dust counter and the Greenburg-Smith impinger. For their purpose the thermal precipitator was found less suitable. Their results embody a prodigious amount of tedious but useful work. Their method too of calculating and com-

1. Grossmann, M. and Sandor, J. *Klin. Wschr.* 1923, **2**, 1833.
2. Walton, R. P. *J. Amer. med. Ass.* 1944, **124**, 138.
3. Anderson, E., Haymaker, W., Henderson, E. *Ibid*, 1940, **115**, 2167.
4. Koelsch, F. Handbuch der Berufskrankheiten, Jena, 1935.
5. Harvey, W. *Brit. dent. J.* 1943, **75**, 221.
6. Donald, K. W. *Brit. med. J.* 1944, **1**, 590.
7. Restarski, J. S. *Nav. med. Bull. Wash.* 1944, **42**, 155.
8. Ross, A. A. and Shaw, N. H. Dust Hazards in Australian Foundries. Technical report No. 1, Industrial Welfare Division, Department of Labour and National Service, Commonwealth of Australia, 1943.

paring dust exposures is worth a trial by other investigators. It is best described in the authors' own words:

> "Consider a foundry process in which there are n distinct operations. Dust samples are collected during each of these n operations and an average concentration for each operation is determined—C_1, C_2 . . . C_n. The average duration of each operation is measured and is multiplied by the number of times the operation is repeated per hour to give the duration of each operation in seconds per hour—t_1, t_2, . . . t_n. Now suppose an operative inhales air at the rate of V c.c. per second, then in one hour he will inhale $C_1 \cdot t_1 V + C_2 \cdot t_2 V + \ldots + C_n \cdot t_n V$ particles of dust—i.e., $V(C_1 \cdot t_1 + C_2 \cdot t_2 + \ldots + C_n \cdot t_n)$ particles of dust. During the hour the operative inhales 3600V c.c. of air, so that the amount of dust inhaled is equivalent to that which would be inhaled if he were working in an atmosphere with a constant concentration of
>
> $$\frac{V(C_1 \cdot t_1 + C_2 \cdot t_2 + \ldots + C_n \cdot t_n)}{3600V} = \frac{C_1 \cdot t_1}{3600} + \frac{C_2 \cdot t_2}{3600} + \cdots + \frac{C_n \cdot t_n}{3600}$$
>
> particles per c.c.
>
> The figure obtained represents the number of dust particles inhaled during one hour of the process for each c.c. of air breathed and the term 'particle-hour per c.c.' is used to describe this quantity."

It seems possible by this method to assess the relative dangers of various foundry processes. One process might show a high dust concentration but the total exposure of the worker might be short; another process might have a lower dust count and the total exposure longer. It should however be borne in mind that the index "particle-hour per c.c." does not take into account the relative dangers of dust clouds in so far as they depend on the character of the constituent particles. For example, the dust arising in blasting operations (sand or shot blasting) may be more deleterious to the lungs because the sand particles have been freshly fractured.

MIDWIVES IN THE SERVICE

APPENDIX A to the White Paper relates briefly how under the Midwives Acts 1902–1936 a domiciliary service has grown up under 188 local supervising authorities, which since the latter date have been charged to see that enough midwives are available. On the whole, it is said, the system though complicated has worked well, and there is little indication in the paper of the direction in which it will be changed except to dovetail into a regional plan. Mr. Eardley Holland told the Association of Supervisors of Midwives on May 17 that the new national maternity service should allow for a growing preference among the women in this country to have their babies away from home, and should provide institutional beds for as many as 70% of them. The proportion of institutional confinements rose from 15% in 1927 to 35% in 1937 and during the war more and more women are asking for it. The supervisors, who ought to know, replied that many of the women are asking to leave home only because they cannot get any help there. They suggested too that on social grounds it is better for the baby to be born at home because the birth is then a family event in which the father has his share. Moreover mothers leaving hospital are apt to lose their milk on getting home (the surprisingly high proportion of 90% was mentioned and confirmed by Mr. Holland). At home the midwife has to attend for 14 days and can see that lactation is properly established before she leaves. Domiciliary midwifery is safe enough except for the case which goes wrong. For these, more important even than the specialist in Mr. Holland's view, is a resuscitation team. The woman who dies in childbirth dies of shock, and the first to come on the scene in an emergency should be a squad with the means and equipment to give transfusion. The specialist can follow a few minutes later. Emergencies would of course be fewer if the women to be confined at home were carefully selected. Any woman who has already borne six children, he holds, should go to hospital. Speaker and audience were at one in demanding that the doctor to be called in by the midwife should have special experience; supervisors naturally emphasised the point that the training of pupil midwives in the conduct of normal labour is far more thorough than that of medical students. The practitioner on whom the midwife calls for help should be one who has gained skill from long experience, or has held a good resident appointment in midwifery. In planning the new service Mr. Holland thought an area of 1 million population with 15,000 births yearly would be an economical unit. At the centre there would be a key institution, with 3 or 4 smaller ones towards the periphery, and local units staffed by general practitioners and midwives. It would not do to divide midwifery, putting the institutions and specialists under the regional authority, and the general practitioners and midwives with a small antenatal clinic under the small local one. The picture Mr. Holland and the supervisors (or "know-how's") have in mind is one of skilled and selected general practitioners supporting the midwives, and a first-class institution supporting both.

RICKETS IN WAR-TIME

WAR and rickets seem to have become associated. There was civil war at the time Glisson's famous pamphlet appeared in the seventeenth century, and it was in Vienna after the 1914–18 war that Harriette Chick and her co-workers made the detailed clinical studies which preceded the elaboration of vitamin therapy. So it was natural to fear that the present war might have arrested the steady fall in the incidence of rickets in this country, and the committee advising the Ministry of Health on the welfare of mothers and young children suggested to the British Pædiatric Association that a national survey would be valuable. The report on such a survey, now before us,[1] cautiously concludes that there is no evidence of any war-time increase in radiological rickets. This terminology strikes a new note in public health inquiry, and indeed the value of the report lies not so much in its evidence about the amount of rickets in the community as in the light it throws upon the changing manifestations of the disease and the need for revising our standards of diagnosis. Members of the association in 23 areas in Great Britain and Ireland took part with the local authorities in the investigation. Children between the ages of 3 months and 18 months were "selected" to secure a representative group of children, various ways being suggested according to local conditions. A clinical examination was made, the results being recorded in a standard questionnaire, and an X-ray examination was made of one wrist in each child. The reading of the X rays was carried out by a committee of three radiologists, the majority view being accepted as the likely diagnosis. Statistical analysis of 5283 records was carried out by Dr. Percy Stocks, who has made a brilliant use of the material presented. A mild winter and a warm and sunny period (mid-January to end of February, 1943) were unfortunate from the scientific aspect and the radiological survey yielded only 106 cases of active rickets, so that detailed analysis of the results as regards feeding and prophylaxis was not possible. The incidence of rickets diagnosed radiologically in children between 3 and 18 months of age is assessed by Stocks at 2½% before 6 months, 4% in the first year and negligible after that period. These figures are for Great Britain; the Irish results proved somewhat erratic. But the real interest of the report comes when the clinical diagnosis is discussed. The rates for active rickets diagnosed on orthodox clinical lines (enlarged epiphyses, enlarged costochondral junctions, delay in closure of the fontanelle,

1. *Rep. publ. Hlth med. Subj., Lond.* No. 92. HMSO, pp. 36, 9d.

craniotabes, late walking and delayed dentition) ranged from nil in St. Albans and Watford to 61% in Sheffield. For the country as a whole, only a small proportion of the clinically positive cases were confirmed radiologically, and this cannot be due to a failure of radiology to detect cases of rickets since the clinical methods missed half of the active cases of rickets diagnosed by X rays. The truth is that there is a large subjective element in determining that an epiphysis is "enlarged," for this term presupposes a normal standard in the mind of the clinical observer. So long as rickets was severe the bony changes were so gross that no doubt could arise, but severe cases are now rare. Spence [2] reported in 1934 nearly 5% of severe active rickets among children of Newcastle-on-Tyne, whereas in the same city in 1939 a similar group of children showed not a single case of rickets.[3] As the disease has become milder so the border-line between normal and abnormal in the clinical findings has become blurred. The present report hints that transitory craniotabes may be physiological, and that bowlegs are more likely to be due to other things than rickets. It sums up the matter thus: "In the severe types the clinical diagnosis of rickets is usually easy, in the milder forms extremely difficult, and in the minor degrees of bony change quite impossible." Hence radiological diagnosis becomes increasingly important, although even the X rays can miss cases if the wrist alone is examined. Chemical assay, especially of the serum phosphatase, seems a more delicate method of detecting the minor aberrations of calcification of bone, and the report holds out hope that some centres will have obtained results by this method which may be published separately.

CEPHALHÆMATOMA

IT has always been assumed that a cephalhæmatoma is produced during the process of birth and that trauma is an essential factor in its causation. Chorobski and Davis [4] suggested that in some cases small vessels passing from the vault to the pericranium are injured during birth, producing an effusion of blood. Naujoks [5] described how he first injured the scalps of stillborn babies by rubbing them forcefully, applied suction and produced lesions indistinguishable from cephalhæmatomas. Sjövall,[6] too, regarded trauma as a most important factor in the production of these effusions, and pointed out that they are much commoner in primiparæ than multiparæ, that 48% occur over the right parietal bone and 35% over the left, and that 11% are bilateral. De Lee [7] also agreed with the traumatic view. Blair Hartley and Burnett [8] draw attention to the paucity of X-ray evidence on this subject. Their observations on cephalhæmatoma have been incidental to their study of craniolacunia. They confirm the accepted teaching that cephalhæmatomas tend to form over the right parietal bone, but say that the effusions are often multiple and in many cases only one of them can be discerned on clinical examination. They also confirm that cephalhæmatomas do not extend quite to the suture line and have observed that if X-ray pictures are taken one side of the cephalhæmatoma will be found to rise sharply from the skull, while the other edge shelves gradually towards the parietal bone, and that ossification starts earlier on the pericranial or outer aspect than on the inner or osseous one. The clinical diagnosis in their view depends on the steepness and the depth of the swelling in relation to its size. They also maintain that an association exists between the formation of cephalhæmatomas and deficient ossification in the parietal bones. In one of the cases of cephalhæmatoma the cranial bones presented an appearance not far removed from overt craniolacunæ. It has long been recognised that babies who have been subjected to severe birth injuries commonly develop cephalhæmatomas, but in most cases of cephalhæmatoma there is no history of antecedent trauma. Again, a birth injury may be severe enough to fracture one or other parietal bone, and yet will produce no effusion of blood. Hartley and Burnett say there is no incontrovertible evidence that cephalhæmatomas are always formed during birth, and suggest that, providing ossification in the fœtal skull is deficient, small effusions of blood may take place during the last month of pregnancy when the head is subjected to a certain amount of pressure as it engages in the pelvic brim. This may be why cephalhæmatoma is commonest in first babies. Even if the cephalhæmatoma starts during the last month of pregnancy other hæmorrhages are likely to follow as full term approaches and during labour itself. They suggest that these swellings may be thought to appear on the second or third day after birth when in some instances they were present at birth and were masked by the caput succedaneum. They rightly draw attention to the important part which fœtal blood deficiencies may play in this condition. An investigation into the relationship between hypoprothrombinæmia and cephalhæmatoma might prove a fertile field for research.

2. Spence, J. C. Investigation into the Health and Nutrition of certain of the Children of Newcastle-upon-Tyne between the ages of 1 and 5 years. Report published by Newcastle Health Department, 1934.
3. Brewis, E. G., Davison, G. and Miller, F. J. W. Report published by Newcastle Health Department, 1939.
4. Chorobski, J. and Davis, L. *Surg. Gynec. Obstet.* 1934, **58**, 12.
5. Naujoks, H. *Arch. Gynæk.* 1929, **136**, 122.
6. Sjövall, A. *Acta obstet. gynec. scand.* 1936, **15**, 443.
7. De Lee, J. B. Principles and Practice of Obstetrics, Philadelphia, 1938.
8. Blair Hartley, J. and Burnett, C. W. F. *Brit. J. Radiol.* 1944, **17**, 33.

HOW HOT IS A BURN?

To the familiar question of the surgeon—How deep is this burn?—might be coupled a similar one from the pathologist—How hot was this burn? Data from human accidental burns are never likely to be obtained, but something has been learnt from experimental study. Lewis [1] showed some years ago that water at 51–52° C. applied to the skin would produce blistering although the subcutaneous temperature did not rise above 42° C. Some more detailed experiments are now reported by Mendelssohn and Rossiter [2] on the changes in the subcutaneous temperatures in guineapigs when they are burned with an iron whose temperature can be accurately controlled. By assuming that the temperature of the skin itself will lie somewhere between that of the burning iron and that recorded by a thermocouple inside a needle placed in the subcutaneous tissues they conclude that irreversible changes take place in the epidermal cells at temperatures between 45° and 52° C. The living elements of the skin do not apparently differ from other body tissues in their ability to withstand heat. They also record the maximum rise in subcutaneous temperature after the application of external heat for periods of a minute. With the highest temperature they used, 70° C., there was a rise of about 20° C. in the subcutaneous temperature. It would be interesting to extend these observations to the effects of much higher temperatures applied for shorter times, and also to investigate the properties of samples of protective clothing. The success of the simple antiflash gear in use in the Royal Navy suggests a method for protecting against high temperatures where exposure is likely to be only brief. The duration and mode of contact with the heat are obviously of greater importance in most cases than the actual external temperature. Thus a hot-water bottle at 60–70° C. may do more damage to the skin of an unconscious person than exposure to temperatures ten times as great will do to a person whose reflexes are fully active.

1. Lewis, T. and Love, W. S. *Heart*, 1926, **13**, 27.
2. Mendelssohn, K. and Rossiter, R. J. *Quart. J. exp. Physiol.* 1944, **32**, 301.

Reconstruction

MINISTER AND BMA

REPLY TO THE COUNCIL'S STATEMENT

ON May 17 in his constituency at Croydon, Mr. HENRY WILLINK, Minister of Health, spoke on the National Health Service proposals as follows :—

This country has a good record in its health services, good in kind and good in results. But it is not yet true that all of us, as individuals, can get all these services when we want them—that the public, in fact, can be sure of getting all that medical science is in a position to offer—because medical men and women still lack the fullest opportunity of giving this to the public as a whole. This is agreed by all.

There is no reason why after the war everyone should not be able to live with the complete assurance, at the back of his mind, that whatever he needs in the care of ill health and help in good health will be there to his hand, as and when he wants it, for himself and his family.

Let us be clear on this. This is not in any sense a policy of "something for nothing." We are all going to pay as fully for our medical services and the care of our health as we have in the past. But we are going to do it in a new way, a way which will separate any problem of cost from the current anxieties of sickness. The nation as a whole, in future, will foot the nation's bill of health, all of us taking our full and appropriate share in the settlement.

We shall arrange that anyone can use any of these services at any time, while not being in any way obliged to use any of them. If anyone wants to arrange any of these things privately for himself, of course he can do so. This is an entirely voluntary service.

We are not going to turn doctors into state officials and hospitals into state institutions, because we do not believe that this would be in the best interests of the people for whom the service is designed. In the health services everything depends on the individual and personal relationship of doctor and patient and nurse, and not on a system. So we are proposing instead to build up on the well-rooted foundations of the past and the present, to intervene—in the sense of state intervention—only just as much as is inevitable to ensure that people in fact get the service which they ought to have; but keeping, and guarding jealously, all the typical British traditional things which we value, the proper professional freedom of professional men and women, encouragement of variety and personal enterprise, the independence of self-governing voluntary institutions, the representative local-government system—all working together in a common service for the community.

The main object of the white-paper is to provoke and stimulate discussion. But discussion and criticism must be constructive, not obstructive. Naturally, any proposal for a great social advance on this scale is apt to stir up feelings a little; and feelings, stirred up, do not always run in helpful channels—and are not always unaccompanied by misrepresentations of various kinds. The atmosphere is admitted to be thick with suspicion in certain quarters. Suspicion is apt to lead to distortion of judgment.

NO QUESTION OF "WHETHER"

Let us be quite clear on this. We are determined to carry through what we believe to be a great stride forward in the national health. Our objective has been endorsed by Parliament. The public have welcomed it. We are sure that it commands the goodwill of all those professional men and women whose lives are directed to promoting health and happiness in the community. The project will go on. The Government will go to Parliament with a full scheme for health, as we have already gone with a great scheme for educational reform.

There is no question of "whether"—only the question of "how" or "in what form." It is on that we want discussion—helpful, expert, critical discussion with all those who are going to be in the front line of this service.

There will be no question of attempting to placate critics of this scheme by unjustified concessions to sectional interests—no matter how vocal some of their spokesmen may be. There will be every question of trying—to the very limit of our energies and ingenuity—to adjust and adapt every detail of this scheme, in patient and tireless discussion if need be, so as to be sure that every helper in it, and every institution in it, gets a thoroughly fair deal and that the service to the public is not founded on the detriment or unhappiness of any section of the public. I believe we shall succeed.

"PREPOSTEROUS ACCUSATION"

Referring to the draft statement of policy issued by the council of the British Medical Association (*Brit. med. J.*, May 13, p. 643), the Minister said :—

In the main—however much I may disagree with this point and that—it is just the kind of thing we want and expect to see; full, constructive, detailed, well-marshalled criticism and review. On this sort of thing we want—and need—the profession's expert help, and we want to talk all these points over as soon as the profession are ready.

Yet even here the other, less helpful and more regrettable, kind of approach finds its way in. As to this, plain speech is best. For instance, I do not believe that the interests of a great new social service which we all have at heart, or indeed the interests of one of the oldest and most respected professions, are best served by the preposterous accusation that the responsible Government of this country, in promoting this great measure, is really only scheming to gain control of the medical profession or to control medical certification—or that the inspiration of the new service is "political rather than medical," whatever that may mean.

Nor am I impressed by the suggestion that the Government ought not to be replanning the nation's health services in time of war. Was this an obstacle to the construction of our educational system? I should have been reluctant to have had to say that the Government had decided not to try to get anything ready in this field for the return of all our young men and women from the Forces—and particularly that we were going to let all our serving doctors come back to a period of confusion and uncertainty as to what their postwar professional opportunities were likely to be.

Nor, I think, is it very helpful or fair to imply that the public is being misled into believing that health is simply a matter of hospitals and doctors and bottles of medicine—and that it has not occurred to the Government that healthy living depends largely on health education, on good environment, on prevention as much as cure. Of course these things are, as the white-paper itself stresses, vital to health; and a lot of other things are too—good employment, economic security, nutrition, the whole field of social organisation and progress. All these things have to be the related parts of a single reconstruction policy.

And, surely, we have no cause to be ashamed of the achievements of this country already in these other fields—of the strides made before the war in housing and public hygiene and the betterment of living standards, of the millions spent so successfully during recent years on improving nutrition and food standards and the knowledge of ways of healthier living generally. And after the war, we shall have every cause to be proud of further advances in all these fields.

"GENUINE ANXIETIES"

I feel that some of these things need saying. At the same time the British Medical Association has produced, in this new document, a mass of good and fair criticism, a mass of practical points and proposals on the shaping of the new service. I shall study these as attentively as I know will the thousands of working doctors on whom we shall confidently rely to give us the service when it comes, and whose every proper interest must and will be studiously safeguarded in the planning of it.

The doctors have some genuine and important anxieties in all this. They fear that, however good our intentions may be, the new arrangements might unintentionally turn out to have the effect of reducing professional life to some kind of dull uniformity, of discouraging some of the variety of enterprise and individualism which is—as I know well—the life-blood of a vigorous profession; that the door might be opened to monotony and regimentation and interference with the doctor's primary allegiance to his patients. But I agree assurances are not enough. The way to safeguard these things is not by verbal assurance—nor, I think, by loose phrases about "bureaucracy"—but by us all sitting down together to thrash out a detailed scheme in which these things will not arise.

The spirit and intention of the white-paper is far removed from any notion of regimentation and control. But it is possible that the form of administration which the white-paper proposes can be altered and improved to give even surer effect to this intention. If so, I am waiting with a welcome for anybody's constructive suggestions to that end, and I assure you that I shall be anxious to accept anything that can be shown to be a genuine and practical improvement. All that matters is that the new health service, on the need for which all responsible opinion is agreed, shall be so framed as to give the best possible service to the public who use it, and to the people who provide it a fair deal and a career of stimulus and interest.

I want this to be a service of individual people for individual people. It must be a willing, enthusiastic service. I believe that we are on the threshold of the biggest single advance in the opportunity of health that this or any other country has had the opportunity of making. We want, and expect, the help and goodwill of all.

THE WHITE PAPER'S PROPOSALS

By an Administrator

THE purpose of the white-paper on a National Health Service is "to examine the subject generally, to show what is meant by a comprehensive service and how it fits in with what has been done in the past or is being done in the present; and so to help people to look at the matter for themselves. . . . The Government want these proposals to be freely examined and discussed. They will welcome constructive criticism of them."

That is a handsome offer and we should accept it in the proper spirit. Unfortunately there was a long delay between the announcement of the Government's intentions and the issue of their proposals. Meanwhile the medical profession and the other interested parties have been eating the air, promise-crammed. Aerophagy makes the critics full of wind, and their reactions are apt to be explosive.

THE GOOD AND THE LESS GOOD

Perhaps the best way of examining the Government's plan is to find out what it proposes, and to what extent its scheme is an advance on the present services. It is hardly fair to begin by setting up a row of arbitrary principles and then show how far the Government has fallen short of your target. You can damn any scheme by such tactics.

The most important partner in the scheme is the patient or person to be served. At the present time our medical service has serious shortcomings: it covers only the insured worker and does not provide for his dependants; and it is limited to such medical care as is within the scope of the general medical practitioner. In other words—to avoid a catalogue of well-known details—it offers a limited service to a limited class. The proposals in the white-paper extend this service to all who wish to make use of it, and to bring within its scope hospital and consultant services of every kind, together with laboratory and other specialised aids to diagnosis and treatment. "It ranges from the one extreme of highly specialised services, requiring relatively few centres for the country as a whole, to the other extreme of services involving a large number of local clinics and arrangements for care in the individual home."

Surely a broadly conceived plan such as this deserves our warm support, especially as it involves no means test with its niggling financial inquiries. To this general approval there should be only one qualification: that the Government fails to bring industrial health into its scheme. This serious flaw ought to be remedied without delay, as the Government's excuses (on p. 10 of the white-paper) for its failure are lame and unconvincing. It is clear that the doctor in a National Health Service, if he is to be a health adviser in any real sense, must be responsible for the care of personal health—which centres on the individual and his family, his home, his food *and his work*. In point of fact the great majority of workers are outside the scope of the industrial health services today; so it is nonsense to suggest that "the enlistment of medical help (for the purposes of industry) is part of the complex machinery of industrial organisation and welfare, and it belongs to that sphere more than to the sphere of the personal doctor and the care of personal health"—blatant nonsense.

In this connexion it is illogical to complain that the white-paper does not deal with environmental and social conditions. It is true that these, as well as education, nutrition and many other matters are vital to the nation's health; but one must draw a line somewhere. The Government have quite properly limited their field of study to personal health, and it is in that field that we should offer constructive criticism. In that field the only significant omission (apart from temporary shortcomings) is industrial health, which is inseparable from the services outlined in the white-paper because it is intimately connected with the everyday work of the doctor—prevention, diagnosis, treatment, prognosis, and aftercare.

DIFFICULTIES

The administration of such a vast scheme is admittedly difficult, because so many interests are involved, but we must be careful not to let administrative obstructions choke a scheme which so clearly will benefit the people as a whole.

The Government intend to use existing central and local-government machinery. Central responsibility will lie with the Minister, who must answer directly to Parliament; and local responsibility with the major local-government authorities, who must answer directly to their electors. This is a plain and sound democratic principle; and the Government goes a step further in order to make sure of getting the best professional advice available: it proposes to create a central health services council, and local councils with corresponding advisory functions.

Two practical difficulties stand in the path of efficient administration, and the Government should deal with them. (1) There are too many Government departments dabbling in medical matters. The people and the medical profession should be able to look to a single central authority. The Government should put their own house

in order. (2) Many local authorities have not enough area, population or financial resources to run an efficient medical service. These small authorities should be amalgamated to create areas of sufficient size. The Government know perfectly well that their proposal to create joint authorities to administer certain services and to plan others is a weak compromise. They know that they are thereby creating further divisions in a health service which ought to be one and indivisible. They know that they are building up immense possibilities for friction and ill-feeling, for jealousies and non-coöperation. They could, if they had the moral courage, create splendid new health authorities, democratically elected, and so lay the foundation-stone for a finer structure of democratic local government than we have ever known, but . . .

A slight modification of the statement in the white-paper (p. 15) would meet the situation admirably :—

> The essential needs of a reorganised *health* service, based on a new public duty to provide it in all its branches, are these :—
>
> (*a*) The organising area needs to cover a population and financial resources sufficient for an adequate service to be secured on an efficient and economical basis.
>
> (*b*) The area needs to be normally of a kind where town and country requirements can be regarded as blended parts of a single problem, and catered for accordingly.
>
> (*c*) The area needs to be so defined as to allow of most of the varied *health* services (*including domiciliary*, hospital and specialist) being organised within its boundaries (leaving for inter-area arrangement only a few specialised services).

OPINION

As regards the doctors themselves opinion seems to be hardening against the white-paper ; and yet in time to come the average doctor will probably lament his short-sightedness if his opposition on points of personal interest serves to wreck the scheme :—

> " For reasons not to love him once I sought,
> And wearied all my thought
> To vex myself and him ; I now would give
> My love, could he but live . . ."

Special Articles

A CLINICAL VIEW OF SHOCK *

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SHOCK is a clinical state, and any definition must allow for the variation characteristic of clinical states. It is customary to speak of primary and secondary shock, but perhaps the terms immediate and delayed would be clinically preferable. Immediate shock may last for only a short time unless the causative factors continue to act.

It is generally agreed that shock is associated with impending or actual failure of the peripheral circulation. As a working definition we might say :—

> Shock signifies a condition following the application of harmful stimuli, or the rapid depletion of the body fluids, in which there is a serious and clinically demonstrable depression of the vital processes of the body, particularly of the circulation.

This definition does not specify any particular symptoms, for the first thing the clinician should learn is that there is hardly one symptom of shock which is constant.

RECOGNITION OF SHOCK

What are its features ? Let us take the description given by W. B. Cannon :—

> " We may say that shock is a general bodily state which occurs after severe injury and which is characterised by a persistent reduced arterial pressure, by a rapid thready pulse, by a pallid or graying or slightly cyanotic appearance of the skin which is cold or moist with sweat, by sweat, by thirst, by superficial rapid respiration, and commonly by vomiting and restlessness, by a lessened sensibility and often by a dulled mental state."

Apart from the omission of a subnormal temperature, this is a very good account of severe shock ; but it does not apply to the lesser degrees. Moreover some serious cases depart from the classical picture.

Reduction of blood-pressure.—Many refuse to recognise shock unless supported by the evidence of the sphygmomanometer ; no fall of blood-pressure, no shock. Yet 30 years ago Parsons and Tyrrell Gray showed that clinical symptoms of shock might appear with a BP that was still high, and W. M. Bayliss pointed out that "a high blood-pressure may coexist with a small blood-volume, the high pressure being kept up by powerful vasoconstriction." In a recent series of 100 cases, the majority of which were clinically reported to be suffering from shock, R. T. Grant found no less than 37 with either normal or raised BP, but noted that the raised BP might be associated with a small pulse. This is what one would expect. As Meakins says :—

> " After the introduction of the sphygmomanometer our thoughts were slowly, ever so slowly, directed to the belief that a falling blood-pressure and shock were synonymous. This is to some degree correct, except that the real condition of shock has been initiated and has travelled well along its course before this spectacular and exact physiological disturbance occurs. It should be considered as one of the later findings to indicate the condition. It occurs after all compensatory mechanisms to maintain the circulation have failed."

In judging the clinical significance of BP in relation to shock three considerations demand attention. (1) In a hypertensive subject the BP may appear normal though in fact it has fallen considerably. (2) In some cases the systolic pressure remains approximately normal but failure of the circulation is indicated by a high diastolic pressure ; thus I have known a dying man show a systolic pressure of 135 while the diastolic pressure was 110. (3) In the development of delayed shock there is a time when the failing peripheral circulation is barely compensated by vasoconstriction and the patient is on the verge of collapse though he may appear in fair condition. This I have called latent shock.

In well-developed shock it is clear that the severity of the shock can best be deduced from the fall in BP. If the systolic pressure fall below 80 the condition is very serious, and a pulse-pressure of under 25 is of bad prognosis.

Pulse.—In serious shock the pulse is usually small, weak and rapid ; but there may be no increase in the rate. Cuthbert Wallace from his experience of the last great war concluded that there was a class of shocked men whose pulse remained slow, and he commented " these almost always end fatally." In his analysis of air-raid casualties Grant singled out a group of clinically shocked cases in which the pulse-rate remained slow, and he called attention to the fact that most of these patients were over 50 years of age ; in younger people the rate seldom remains slow. A. Kekwick and his fellow observers reported 5 cases in which the rates were 86, 82, 104, 92, 70 with systolic pressures of 55 mm. or less.

Temperature.—I have come to regard a subnormal temperature as one of the most constant signs P. C. Kinnaman's experiments showed that a fall in temperature was a better guide to shock than the fall in BP, and Kekwick states that " the general temperature of all severe cases is invariably subnormal." It is commonly thought that this fall in temperature is coincident with, and dependent upon, the fall in BP ; but we know that the temperature may quickly fall to 95° or 96° F. in cases of immediate shock without a great fall in BP—e.g., in perforated peptic ulcer in which the pressure seldom goes below 100 mm. Hg. From this and similar facts I think it likely that in some cases of shock there is a direct reflex inhibition of metabolic processes.

Other evidence of shock.—The skin is usually pale or cyanotic and generally cold, and sweating may be profuse. It is often the onset of these two symptoms which indicate to the surgeon that shock is present. If the cheek feels cold to the back of the observer's hand,

* Extracts from the annual oration delivered before the Medical Society of London on May 8.

and if small beads of moisture appear on the forehead, one knows that the patient on the operating-table has had enough, even though the BP may still be within normal limits. Latent shock is becoming patent.

Mental dullness is a variable symptom. It is quite true that many shocked patients are dull or even stuporose, but others are mentally alert. Kekwick remarked that 17 out of 24 shocked patients were mentally clear and rational. It is difficult to account for these differences.

DIAGNOSIS

It is evident that if we are to diagnose shock early, before any damage is done to the tissues of the nervous system and at a time when remedial measures will have the best chance, we must not wait till all the textbook symptoms have appeared. We must found our diagnosis on a general appreciation of the clinical picture. Shock may be indicated by a subnormal temperature with a low BP, although the pulse-rate may be within normal limits. Or it may reveal itself by pallor, sweating, subnormal temperature and a small rapid pulse, while the BP may remain approximately normal. And there are also cases in which the appearance and mental condition give no indication of the serious state of the circulation which the sphygmomanometer may demonstrate.

When a person has sustained injuries which are likely to produce shock one must assume the presence of latent shock even though the general appearances belie this diagnosis. The good clinician does not judge the picture by one single part of it.

ÆTIOLOGY AND PATHOLOGY

The experimentalist suffers from two disadvantages in studying shock: he excludes pain and he does not deal with human beings. The clinician on the other hand is usually so concerned with the treatment of his patient that he cannot often or easily carry out all investigations. What view of the pathology fits in best with the experience of the clinician?

Let us start from the one factor in shock upon which all experimentalists seem to agree—i.e., there is a serious reduction in the volume of blood in effective circulation, or as Moon puts it "a volume of blood which is relatively inadequate to fill the vessels." Does this view find support from the clinician? Certainly. As the blood-volume rapidly diminishes from severe hæmorrhage, the symptoms of shock appear; similarly, in cholera, the rapid depletion of the body fluids, which must reduce the blood-volume, is followed by an acute collapse simulating shock. This view is also confirmed by the effect of treatment, by transfusion or infusion. Hence it is reasonable to accept the belief that both in traumatic and other forms of shock there is a diminution of the effective circulating blood-volume.

The volume of the blood in active circulation may be diminished in one or more of three ways: (1) by gross internal or external hæmorrhage; (2) by escape of the fluid part of the blood directly into the tissues or indirectly into the secretions (sweat) or excretions (cholera or dysentery); or (3) by stagnation of blood in dilated capillaries.

Every clinician is aware that the volume of blood in the vessels may be considerably reduced before any serious symptoms ensue, since the reduction is compensated by immediate vasoconstriction. The loss of a pint of blood has little effect on the circulation. The loss of two pints may cause faintness, a temporary fall of BP, and acceleration of the pulse; but recovery is rapid. A loss of three pints will cause serious symptoms—pallor, sweating, subnormal temperature, coldness of the extremities, rapid pulse and lowered BP. In shock which is unaccompanied by hæmorrhage it must be assumed either that the fluid part of the blood transudes into the tissues or that blood is lost to the circulation by stagnating in newly dilated capillaries. Clinically both these mechanisms must be invoked to account for the different types of shock. Immediate shock must be due to an immediate cause—presumably a nervous reflex causing vasodilatation in some part of the peripheral circulation (splanchnic area, muscles, or elsewhere).

The importance of this nervous reflex has been minimised by many; yet there is little doubt that strong afferent stimuli will of themselves cause shock. G. W. Crile's view that this was due to an exhaustion of the vasomotor centre is no longer regarded as likely, but we must assume some inhibition or incoördination of this centre to account for the onset of immediate shock in (for example) cases of perforation of a peptic ulcer, acute strangulation of intestine, or even severe colic. Though Moon asserts that "conditions accompanied by prolonged intolerable pain such as renal or biliary colic do not cause shock" the experienced clinician knows that this is too strong a statement. Few can doubt that severe pain can initiate, accelerate or aggravate shock. When the sensorium is shielded by morphine, shock is much later in onset or may not appear at all. In immediate shock there is a natural tendency to recovery, which generally takes place within an hour or two of the removal of the causative agency; and this supports the view that it is the result of a nervous reflex.

What light can the clinician throw on the way in which delayed or secondary shock is caused? Is it due to the loss of fluid into the tissues of the damaged part as asserted by A. Blalock? Does it depend partly on the barrage of nervous impulses which ascend from the traumatised area and cause reflex vasodilatation as claimed by O'Shaughnessy and Slome? Or is it ever due to the absorption from the injured part of substances which may injure the epithelium of the capillaries and permit excessive transudation of fluid from the peripheral circulation? The clinician must surely answer that none of these explanations is the whole truth. Much blood and plasma is certainly lost into the tissues of a traumatised area, but severe shock occurs in cases where it seems impossible that fluid has escaped in quantities sufficient to cause serious symptoms, and there is no reason why constant and powerful afferent stimuli from the injured part should not contribute—as they appear to do in immediate shock—by causing reflex dilatation of some part of the capillary circulation.

The view that toxins formed in the breaking down of injured tissues produce shock was widely held during the last war but has since lost favour. Recently however H. N. Green obtained a shock-producing substance from fresh voluntary muscle and found that it was rapidly destroyed in the muscle after death. Given intravenously this substance had a powerful depressant action on the BP. Clinically one can say nothing as to the likelihood of shock-producing toxins from muscle, but no-one who has seen the occasional rapid development of shock after the relief of obstruction of a coil of small intestine can help thinking that toxins from the small gut may occasionally have a shock-producing effect. Such a toxin might either increase the permeability of the capillaries or have a direct action on the vasomotor centre.

It is a matter of common clinical experience that some cases of shock fail to respond to treatment or respond only for a time. In a patient exsanguinated by hæmorrhage transfusion of blood usually brings rapid and permanent recovery, but in a patient with severe shock the improvement sometimes lasts only so long as the transfusions are continued. Since the vessels cannot be for ever dilating it is certain that the fluid must be constantly transuding from the vessels, and quite probable that the vasomotor centre has in these cases lost its vitality. The damage to capillaries and nervous system has advanced so far that the process is irreversible.

Thus there are several mechanisms which may produce the same end-result—failure of the peripheral circulation.

TREATMENT

If immediate shock results from an immediate vasomotor failure caused through nervous channels, it will be clear that the head-down position should be adopted until the normal reaction re-establishes vascular tone; at the same time the cerebrum should be shielded from pain by the administration of morphine. Body heat should be conserved by application of warmth, but not to such an extent as to produce or increase sweating. Cardiac stimulants may also be of use in such doses. In immediate shock fluid is seldom essential.

In delayed shock, or in cases of immediate shock which do not recover within an hour or two, we have also to

deal with the extravascular loss of fluid which urgently calls for replacement. Whole blood, plasma, or (when nothing else can be got) normal saline may be used to replace lost fluid and maintain the blood-pressure. This treatment must be continued until the blood-pressure is stabilised or until there is no chance of recovery. Operation should be postponed until the circulation has been restored as much as possible, and every care taken to minimise trauma during the operation.

While no drug will restore a terribly shocked body to its normal state, morphine will give much-needed rest to the nervous system.

GENERAL MEDICAL COUNCIL

PRESIDENT'S ADDRESS

OPENING on Tuesday the 161st session, Sir HERBERT EASON announced with regret the retirement from the council of Mr. John Charles Flood, representative of the Apothecaries Hall of Ireland, who (in his own words) had "forsaken the scalpel for the cowl." His successor, Mr. Myles Keogh, had extensive experience in the management of Dublin hospitals. He deplored the circumstances which had prevented them from welcoming Mr. Edward Sheridan for his final appearance at their board. The council would miss their charming colleague and the Dental Board was losing one who represented the highest traditions of the dental profession.

REVISION OF THE CURRICULUM

Inspection of qualifying examinations in medicine, surgery and midwifery is now, the President said, approaching completion, but the examinations not yet inspected include some held in Eire. Attendance of inspectors at these being delayed owing to restrictions on travel, the education and examination committees may think it advisable to proceed, in order that the council may have the advantage of the information and conclusions derived from the inspection before entering upon the task of revising the curriculum. In view of the general ferment which has arisen in connexion with medical education, it may be profitable, he added, if I recapitulate shortly, for the benefit of the council and of the public, the action taken and the recommendations made by the council on such questions within the last year or two.

In the evidence submitted to the *Departmental Committee on Curriculum and Examinations* the council called attention to the poor standard of English which many students had attained by the time they began their medical studies, the chief reason for this defect being premature specialisation at school. As long ago as 1934 the council had reached the conclusion that the standard of general education for prospective medical students should be at least equal to that of entry into other learned professions, and not below that of the matriculation examination of universities. The council added in 1942 that this education should be broad, and cannot be regarded as complete unless it includes the general principles of physical and biological science. Courses leading to the first MB examination should be taken in a medical school. This considered view was based on the facts that laboratory facilities at schools vary widely, very few approaching university standard. The teaching of these at school encourages students to start specialising too early. If taken during the first year in a medical school it enables the authorities to make an initial assessment of the student for the medical profession, those who prove unsuitable being advised to withdraw before commencing professional study.

In the evidence submitted to the *Inter-Departmental Committee on Medical Schools*, the council emphasised that in most communities the medical man has always been looked on as an educated man of the world, whose opinions on problems other than those of medical interest carry a certain weight; if this position is to be maintained, the medical student should have a high standard of general education, and an outlook beyond the confines of the best-planned examination syllabus. To ensure a complete and adequate medical education teachers should work in close coöperation, impressing upon the student the bearing of preclinical subjects upon clinical studies. Clinical teachers should have associated with them the teachers of purely scientific subjects in any investigation or research. As regards the curriculum as a whole the council have to bear in mind that it is primarily that required for the general practitioner, higher medical education being rather a matter for postgraduate instruction. But the study and teaching of social and preventive medicine deserve further encouragement, in order that medical students and practitioners may be better acquainted with the influence of social, occupational, genetic and domestic factors on the incidence of human disease and disability; and that it is desirable to seek and promote measures, other than those usually employed in the practice of remedial medicine, for the protection of the individual and of the community against such forces as interfere with the full development and maintenance of man's mental and physical capacity.

The council had also expressed agreement with the draft interim report of the *Medical Planning Commission* that the medical student who has passed his final examination should spend some time in practice under supervision before embarking on his own account. To regulate this position, however, some amendment of the Medical Acts would be essential for the purpose of conferring upon him, during the interim period, those privileges of a registered medical practitioner without which he could not profit fully by his experience.

It is clear, the President concluded, that a revision of the medical curriculum is both required and desired, but I should point out that it is not the function of the GMC to impose a curriculum upon the licensing bodies. All that the council do, and can do, is from time to time to issue recommendations on general lines to these bodies, indicating what are the desirable essentials of a curriculum, both as regards time and content. It is for licensing bodies themselves to arrange the curriculum as they think best in the interests of medical education, subject to the maintenance of the legal minimum standard. The Medical Acts Commission of 1881–82 had stated:

> "It would be a mistake to introduce absolute uniformity into medical education. One great merit of the present system, so far as teaching is concerned, lies in the elasticity which is produced by the variety and the number of educating Bodies. Being anxious not in any way to diminish the interest which the teaching Bodies now take in medical education, or to lessen their responsibility in that respect, we desire to leave to them as much initiative as possible. In certain matters of general importance, such as the duration of study and the age at which a student should be permitted to practise, common regulations ought, we think, to be laid down; but we wish to record our opinion that nothing should be done to weaken the individuality of the Universities and Corporations, or to check emulation between the teaching institutions of the country."

This, said the President, had reflected the policy of the GMC before that time, as it had anticipated their policy since.

DENTAL REGISTRATION AND DISCIPLINE

The council, said the President, had also completed the presentation of evidence to the Inter-Departmental Committee on Dentistry. They had proposed that a dental authority fully representative of dental licensing bodies and of the dental profession should be given responsibility, without any reference to the GMC, for matters of dental registration and discipline, for control of their expenditure, and for the exercise of their rule-making powers; that this authority should also replace the GMC as the authority responsible under the Dentists Acts for dental education and examinations; but that they should, when acting in this capacity, have added to their membership a fixed proportion of members of the GMC appointed by the council, and should include these members in a statutory committee on dental education and examination.

REGISTER OF SPECIALISTS

The President went on to recall some apprehension he had expressed in his last address (Nov. 27) as to the proceedings of another organisation with regard to what he felt constrained to describe as a proposal to establish a register of specialists under the auspices of certain licensing corporations. The council's anxieties in the matter will, he said, have been materially allayed by the answer given by the Minister of Health on Feb. 3 to a question in the House of Commons by Sir Douglas Hacking, a member of the council. This reply (which

appeared in full in the *Lancet* of Feb. 12, p. 228) ended with Mr. Willink's assurance to the effect that—

> "If, at a later date, it were thought desirable that consultant and specialist appointments should be restricted to persons qualified in some particular manner and enrolled on a list for the purpose, it would be necessary to provide for the establishment of a register on a statutory basis in a manner approved by Parliament."

MEDICINE AND THE LAW

Fresh Inquest Ordered

IN Rex *v.* Huntbach the High Court has taken the strong and unusual course of upsetting the finding of a coroner's court. The judges, who had not seen and heard the witnesses at the inquest, substituted their own view of the evidence for that of the coroner who had. The application was made on behalf of the mother of a young miner who was found dead in a disused colliery working. He had been engaged as a haulage hand and was sent to the lowest levels of the pit. Complaining that the work was too heavy for him, he was directed to another part of the mine. He never appeared, however, at the place to which he had been directed. Later his dead body was discovered in the disused working; he had apparently climbed over an obstacle and past a notice which said "No Road," and had succumbed to fire-damp. The coroner took the view that the deceased laboured under a sense of grievance on account of his treatment and, with his mind in some degree deranged, committed suicide by deliberately exposing himself to fire-damp in a part of the pit which he knew to be dangerous.

The finding of suicide has little significance in law; the decision of a coroner's court has no binding effect outside. But, for sentimental reasons easy to understand, the mother deprecated and desired to displace the finding; indeed it was said that the mine-workers, who knew the place, themselves resented the suggestion of suicide. The High Court judges considered that the coroner had misled himself into adopting a theory for which the evidence furnished no foundation. They recalled the dictum in Southall *v.* Cheshire County Mews, a workmen's compensation case decided in 1912, that there is a presumption against suicide.

In this matter the High Court exercises jurisdiction by virtue of section 6 of the Coroners Act of 1887. It may order an inquest to be held where a coroner refuses or neglects to act, and it may quash the inquisition and order a fresh inquest where such a course is deemed "necessary or desirable . . . by reason of fraud, rejection of evidence, irregularity of proceedings, insufficiency of inquiry or otherwise." Section 6 was enlarged by the amending act of 1926, which declared that for the removal of doubts the court could exercise its powers whenever satisfied that "by reason of the discovery of new facts or evidence" a fresh inquest was necessary or desirable in the interests of justice. In the Huntbach case the judges made no criticism whatever of the coroner's procedure; it merely declared that there had been no sufficient evidence to justify the verdict.

The chief authority on section 6 is the decision in Rex *v.* Divine in 1930 where two men had been killed in a traffic accident. The coroner, before holding his inquest, had viewed and discussed a damaged vehicle in a garage, taking with him a man whom he introduced as "one of my regular jurymen"; this man afterwards acted as foreman of the jury. It was argued for the coroner in the Divine case that the only grounds on which an inquisition was ever quashed were either (1) interference with the verdict or deliberations of the jury, or (2) corrupt misleading of the jury, or (3) putting before the jury without warning evidence which was not on oath. The judges ordered a fresh inquest because, amongst other things, they disliked the practice of having a small panel of "regular jurymen" and the arrangements for the partial view before the inquest. "If," said Talbot, J., "the inquest has been so conducted that there is real risk that justice has not been done, this court ought not to allow the inquisition to stand." The Huntbach case seems to break fresh ground in the reassessment of the value of the evidence. The judges presumably concluded that the finding of suicide was one which no tribunal could reasonably have reached.

In England Now

A Running Commentary by Peripatetic Correspondents

I HAVE suffered the ignominious experience of appearing in the unit returns as Supernumerary to Establishment. Worse still, my successor—a mere child with the RCP Censors' branding marks still fresh upon him—has shown to all the world how simple it is to do the work of a medical specialist in this unit and be finished in time for 11 o'clock tea in the mess. By one of those paradoxes which are commonplace in the Army, I find I have done more medicine in a month as supernumerary than in any previous three months while holding the combined appointments of medical specialist and "2 i/c." It happened that a minor deity, clad in crimson tabs and hat-band, discovered a neighbouring unit struggling along without a physician to keep an eye on the surgeons, so he promptly arranged that I should be loaned out to make good the deficiency. Thus I have added to my experience by spending a month with a Dominions crowd, and excellent fellows they are. My gain in this direction has done something to compensate for my chagrin in witnessing how easily my old unit has managed without me, and how indifferent my new unit seems to be about my delay in joining them. Thus, like Mahomet's coffin, suspended midway between earth and heaven, I heard the Voice from the misty mountain top announcing that Major Popplethwaite would "proceed forthwith. . . ." Compared with the gyrations of the military machine, the mills of God move with the speed of an electric centrifuge all out.

* * *

One of the advantages of being the least peripatetic doctor in England is that I have had an excellent opportunity of watching the change that has come over my part of the Home Counties since September, 1939. It is the villages and hamlets that intrigue me most. Superficially, there is little change apart from the almost Edwardian quiet of their main streets, even if the village happens to lie on an arterial road. No matter what the time of day, there is seldom more than an occasional lorry parked outside a shop and one or two local tradesmen's vans, though with increasing frequency a pony and trap adorn the scene. Whether it be morning or evening the local thoroughfare is never crowded, just a few shoppers who have leisure for a gossip with the butcher or grocer standing in his doorway. The only time the village comes to life is when the children are on their way to or from school; then the air echoes and re-echoes with their shrill cries. At first sight the war seems far away; here is none of the rush and bustle of town with the passers-by snatching the latest edition from the newsvendor and the whole scene dominated by the variegated uniforms of the United Nations. It is all comforting and reassuring, especially after a hectic day in town; here, one feels, is the real England, the England which has changed very, very little during the centuries. Dictators may come and go; political creeds may wax and wane, but our English villages, one would say, are not to be changed.

But the changes are there, though they may not alter the essential character of the scene. In spite of the shortage of man-power, the streets are still tidy and the cottages do not appear neglected; the shop-windows still manage to make a brave display even though they be reduced to the restricted items of a war-time diet or a war-time wardrobe, but where are the men-folk? Why is it that in the evening the village green has not its little groups of local politicians settling the local affairs of state? What is that notice pinned to the door of the inn, "Only open 6–8 tonight."? Then there are those little wooden shelters, each accommodating three or four sacks neatly labelled "Paper," "Tins," "Rubber," "Bones"; and the dustbin marked "Pig Food" not far away. Most topical of all is the crash of a military convoy suddenly bursting on the scene. Lorry after lorry, or gun-carriage after gun-carriage rushes through, each keeping its set distance from its predecessor, with roundhead motor-cyclists in attendance, the whole preceded by a lorry bearing a gaily coloured flag. Out in the open country you soon meet evidence of the tree-

feller. A familiar stretch of road looks somehow different; suddenly one realises that the lovely avenue of beeches has gone to swell the war effort. Fortunately the loss is often compensated by the opening up of lovely vista. The fields are a hive of activity, with the Women's Land Army in their attractive uniform everywhere. Perhaps that is the biggest change of all—the women on the tractors, leading cart-horses, driving the Royal Mail, the milk van, the grocer's van. Even the local police force is becoming ladylike, though the male holds sway over patrol duties.

Sunset brings back the Middle Ages. No longer is the eye cheered by the lighted window in the labourer's cottage. No longer do the scattered street lamps throw down their yellow pools about the sleeping street. All is dark as Egypt's night. England seems to have gone to earth, and so effectively that one's tired mind sometimes wonders whether it will ever come to life again. Even the full moon does not altogether remove the sense of foreboding. The owl may still hoot from the distant coppice, the farm-dog may still break the silence of the night, but there is only a prowling warden to show that this is a human habitation.

* * *

In the remote days of June, 1940, the hotel manager asked my wife and me if we would help, in case of need, at the first-aid post he was establishing in the gentlemen's hairdressing saloon. With the proviso that our other duties and commitments should come first, we readily agreed. Being psychiatrists whose knowledge of surgery was by then wellnigh twenty years out of date, and being determined not to disgrace ourselves or our great profession in front of the tried first-aid veterans of the hotel staff, we hastened to purchase first-aid manuals. Somehow we never had leisure to read them and it was a long time before we needed this elementary knowledge. But we did in the end. It was customary, immediately the alert sounded, for the Flag Officer in command of the port and its defences to leave the hotel and board his waiting car. This craft appropriately carried the white ensign and was manned by two lusty ratings. One evening, the admiral's exit synchronised with an attempt on the part of several people the worse for liquor to enter the hotel. The situation was one dear to the heart of the ratings, who had long chafed at their relative inactivity. One of them, giving full rein to his previously frustrated aggressive impulses, sailed in striking hard and true. Owing to the fact that the action was fought at night in black-out conditions there occurred some misunderstanding as to targets, with the result that the head night-porter, elderly, dignified and grave, was soon a casualty. So there sat Charles, calm as ever, though with countenance somewhat asymmetrical, enthroned on one of those contrivances, half chair, half operating-table, which adorn a gentlemen's hairdressing saloon. We diagnosed a fractured jaw. But how to set about it? How to strap it up or whatever one does with such things? And then, echoing down the long galleries of memory, the recollection came . . . the student days . . . the practical surgery theatre . . . the practical surgery class. Charles's jaw was soon at rest, and, as I was immensely gratified to learn from the surgeon subsequently, "in good position." In my ignorance I was gravely concerned because of the patient's dysphagia, a common enough symptom my little book afterwards told me, as also it told me that jaw fractures are often bilateral. (Preserve us!) Anyway I lost no time in driving Charles to the hospital and delivering him into the cool and capable hands of the youthful RSO. It's grand to be a real doctor once in a while.

* * *

Can any of our medical families, I wonder, count more than seven generations of practitioners in the male line? The results of last month's examinations enable us to welcome to the profession the first medical great-great-great-great grandson of Joseph Fox, who was born in 1719 and practised at Falmouth. If female descent is accepted, the family has had eight medical generations, for Joseph Fox's wife was the daughter of an apothecary.

Parliament

ON THE FLOOR OF THE HOUSE

MEDICUS MP

THIS week we have discussed rural water-supplies, the cleanliness of milk and a new method of scrutiny by Parliament of war-time orders and regulations. Not long ago we had a debate on water policy in general and now we have proposals for rural water-supply and rural sewerage, which Mr. Willink described as an instalment of a general national plan, "preparatory legislation," but which members called many things less polite. The sum of £15 million is to be spent on rural water-supply and rural sewerage in England and Wales and over £6 million in Scotland in grants-in-aid by the Government. The balance was estimated at £75 million for England and Wales to come from local authorities, and Mr. Walkden wanted a large share of it to come from the Treasury. Mr. Clement Davies asked for the bill to be withdrawn in favour of a "real national" proposal. Mr. T. Levy, who has made a study of water-supply, is also all out for a national scheme. He said the original statement of water policy in the white-paper "was based on platitudes" and the production of this little rural supplies bill was "treating this House of Commons with derision." The bill, he affirmed, would not bring a single pint of water to anyone living in a remote rural area and was "a sham, a pretence and camouflage." No-one else was quite as scarifying as this, but no-one particularly liked the bill because it was an improvisation rather than a part of a plan; and the Government, while talking of its plans for housing and water and other reconstruction projects, has up to date produced mostly improvisations. No-one in the debate raised the question of the disposal of sewage, but we cannot go on indefinitely pouring potash into the sea.

The Food and Drugs (Milk and Dairies) Bill discussed on Friday was in a different position. It was brought forward by the Minister of Agriculture, and agriculture has been planned more successfully than almost any department of our national life. The object of the bill is to produce milk of steadily improving quality, "milk in which the public and the medical profession could have complete faith." The consumption of liquid milk has been raised during the war from 860 million gallons a year to 1185 million gallons. The Minister wanted to raise it by a further 350 million gallons and to do away with rationing. This is a big, though not impossible, demand to make on the dairy farmers of the country, but it can only be done by increasing the efficiency of the industry. The National Farmers Union backs the Minister's proposals. A group of Tory members had tabled an amendment rejecting the second reading on the ground that the bill "deprives local authorities of their existing responsibilities" and urged that legislation should be deferred until a Royal Commission had "reported on the measures necessary to secure efficient administration." The bill centralises veterinary inspection and the environment of the cows in the hands of the Ministry of Agriculture. The responsibility of the MOH concerned for control of disease in humans remains unimpaired. But it is clear that many local authorities have not set up a sufficiently high standard of cleanliness of shippons or of milking processes. When the bill becomes law the new machinery will make it easier to remedy this. More veterinary officers will be required, and fortunately the intake of students has risen considerably lately.

This bill is part of the Ministry of Agriculture's bigger plan for a more efficient farming industry. The reign of dirty milk is being brought nearer to its end. Members who were at first inclined to support the amendment found that the debate cooled their ardour. The amendment was withdrawn and only 13 voted against the bill.

SCHOOL MEALS.—Mr. CHUTER EDE gave the number of departments of public elementary schools for whose pupils no school meals are available as approximately 11,000 out of 28,000. A large amount of new provision is under construction, he added, and only a small number of secondary schools are without facilities.

FROM THE PRESS GALLERY

Malaria in West Africa

In the House of Lords on May 16, in reply to Lord TEVIOT, the Duke of DEVONSHIRE, under secretary of state for the colonies, said that Professor Blacklock of the Liverpool School of Tropical Medicine had recently returned from a second visit to West Africa, where he had again surveyed the antimalarial measures in progress, and had examined the work which had been carried out since his previous visit in 1940. Although he had not yet submitted a report, he was understood to be satisfied that a great deal had been done by the civil and military authorities and that the position had much improved. Dr. Bruce Wilson, of the Rockefeller Foundation, was at present visiting West Africa, and would be given every opportunity of seeing and commenting on antimalarial measures there, in the light of his experience as chief officer in the Foundation's recent campaign (reviewed in the *Lancet* of May 20, p. 664) in Brazil to eliminate the anopheles mosquito, which was also the predominant species in West Africa. For nearly two years a special investigation, financed by a grant from United Kingdom funds, had been proceeding in regard to this mosquito in British Tropical Africa, with particular reference to methods of control.

QUESTION TIME

Certification

Dr. RUSSELL THOMAS asked the Minister of Health if he had now framed rules for certification of sickness by doctors under the proposed National Health Scheme, or whether he proposed to leave such certification to a doctor's free and unfettered professional opinion in accordance with the tradition of medical practice.—Mr. H. WILLINK replied: The answer to the first part of the question is No, and to the second part that the form and method of medical certification is one of many questions which I hope to discuss in due course with the profession's representatives.—Dr. THOMAS: In view of the fact that the white-paper, of necessity, involves rules for certification, which must again involve penalties on the doctor, are not these rules directed to ensure the increased productivity of the patient rather than his health and happiness? Do they not prepare the way for the mobility and direction of labour when the war is over?—Mr. WILLINK: No. The purpose of certification is to give those entitled to insurance benefits the evidence which they need.—Mr. G. GRIFFITHS: Will the Minister keep as stiff a back on this matter as he kept last night at Croydon?

Professional Secrecy

Dr. THOMAS asked the Minister whether he would give an assurance that under the proposed National Health Scheme no doctor would be called upon to divulge the illnesses of patients to a third party, except in a court of law, in accordance with the tradition of medical practice.—Mr. WILLINK replied: There is no intention of departing, in this respect, from the familiar principles which have hitherto governed the doctor-patient relationship.—Dr. THOMAS: In view of the fact that the illnesses of nearly all of us will be known to the Ministry of Health, could not these facts be used by a Government department for its own secret purposes, contrary to the ancient tradition of privacy which has always existed between doctor and patient?—Mr. WILLINK: My honourable friend has referred to something that could be done. I have said there is no intention of departing from the present practice.

Production of Penicillin

Mr. T. H. HEWLETT asked the Minister of Supply whether he could report on the possibility of producing penicillin in any bacteriological laboratory with a well-trained staff.—Mr. C. PEAT replied: Small quantities of penicillin in its crude filtrate form can be produced in any bacteriological laboratory. This penicillin could be used for treatment in certain classes of case under special medical supervision. Such laboratories would not be able to make any significant amounts of pure penicillin for general distribution.

Notification of Leprosy

Mr. T. DRIBERG asked the Minister of Health if he would make leprosy a notifiable disease.—Mr. WILLINK replied: No. I am advised that leprosy is not in the same category as the diseases to which compulsory notification applies in this country, where conditions are such that it is most unlikely to spread. The disease is almost exclusively contracted abroad and administrative arrangements are in force whereby any case of leprosy found by the Service medical authorities or through the Emergency Hospital Service is brought to my department's notice: and all practicable steps are taken to deal with it with due regard to the medical and social well-being of the unfortunate sufferer.

Smallpox at Yeovil

Mr. W. LEACH asked the Minister the date on which the Yeovil school-teacher reported to be suffering from smallpox entered hospital; whether she was still there and, if not, the date on which she left the hospital; how long she had spots before the investigation was made; how many doctors were engaged in the investigation; whether they made the diagnosis of smallpox which was not confirmed; and whether doctors from his Ministry examined the case.—Mr. WILLINK replied: The patient was admitted to hospital on April 1, and discharged on April 20. My information is that she had spots on March 28, but was not able to visit her doctor until two days later. Nine doctors were concerned in the investigation of the case, including three of my medical officers. The opinion reached by six of them that it was a case of smallpox was not shared by two of my officers, but the precaution was taken of treating it as a case of smallpox. I am advised that occasionally the diagnosis of smallpox presents great difficulties and there is ample room for differences of medical opinion. At least three of the local doctors who judged this case to be one of smallpox were practitioners with substantial experience of the disease.

VACCINE LYMPH.—Mr. WILLINK said experience had shown that the tests for the purity of vaccine lymph prescribed in the regulations of 1931 resulted in the rejection of considerable quantities of safe material. The new regulations prescribe a revised schedule including a less stringent test for the presence of bacteria. A secondary effect of the revision is to remove the requirement that the prescribed tests shall be applied at the final stage of manufacture. The application of tests for the presence of living bacteria is replaced by a provision specifying the maximum number of living bacteria which may be present.

VACCINATION OF NON-CONTACTS.—Mr. WILLINK pointed out that in the circular issued to local authorities in 1929, the recommendation that school-children and young adults should not be primarily vaccinated unless they had been in personal contact with smallpox was qualified by the words "so long as smallpox prevalent in this country retains its present mild character." This did not apply to the most recent occurrences of the disease.

On Active Service

AWARDS

THE following honours have been conferred in recognition of gallant and distinguished services in Burma:—

DSO

Major B. G. A. LILWALL, MB LOND, FRCS, RAMC

MC

Captain H. C. BANIK, IAMC

Lieut. BASHIR AHMAD, IAMC

The following immediate award has been made in Italy:

MC

Captain ELSTON GREY TURNER, MA CAMB, MRCS

Throughout the period when his battalion was being constantly attacked and subjected to artillery, mortar and small-arms fire, he showed complete disregard for personal safety in caring for the wounded. Owing to the nature of the country it was found impossible to establish a regimental aid-post to carry out its normal function and Grey Turner went at all times to the places where the shelling was most severe, or the battle fiercest, and tended the wounded under fire, often in front of our own positions and he organised their evacuation. He injured his knee in a fall but did not disclose this fact until the battalion was relieved, but carried on over very difficult country, in the discharge of his tasks.

CERTIFICATE IN PSYCHIATRIC SOCIAL WORK.—The University of Edinburgh has approved regulations for a new course to train and qualify social psychiatric workers. Candidates, who should be over 21, must hold a social study diploma or certificate, or a degree in sociology. The course will last a year and will normally start in October. Applications should be in the hands of the director of studies, Department of Social Study and Training, by Sept. 1.

Letters to the Editor

NOTIFICATION OF TUBERCULOSIS

THE PATIENT WITH A PRIMARY INFECTION

SIR,—In view of the difficulties about to confront local authorities responsible for the treatment of all forms of tuberculosis, it is important to consider what action should be taken when a primary tuberculosis complex is discovered. Mass radiography will make such cases more numerous.

Undoubtedly there is a great concentration of tuberculous morbidity in the first few years after the primary infection. Nevertheless in the great majority of cases this initial infection resolves spontaneously with no clinical signs or symptoms of intrathoracic disease. Everyone is a positive skin reactor by the age of 45; and at some time or other everyone must have developed a primary complex. Examination of stomach washings at that time would possibly have revealed tubercle bacilli.

For the purpose of the annual returns required by Memorandum 37/T, patients suffering from pulmonary tuberculosis include persons having tuberculosis of the pleura and intrathoracic glands; and the same memorandum classifies notified cases into TB− and TB+ groups. Discovery of the tubercle bacillus by any method and from any source (sputum, pleural fluid, fæces, &c.) is sufficient to warrant classifying a patient as TB+. Hence every case of primary infection in which gastric lavage is positive should be classified as "open." But if everyone's stomach washings were examined shortly after the acquisition of a positive skin reaction to tuberculin, a great number of people now enjoying perfect health would have been classified as TB+ cases of pulmonary tuberculosis; and according to the memorandum a case classified as TB+ can never, from a statistical point of view, become TB−.

Cases of primary infection which will heal uneventfully constitute the majority of cases picked up by the tuberculosis officer during examination of contacts of known "open" cases. At the moment there is only one course which he can take—i.e., to notify them as cases of pulmonary tuberculosis. This carries many disadvantages.

Children so notified will remain on the tuberculosis register for at least 5 years, and will suffer from the stigma which attaches to periodic visits to the dispensary. Yet to admit such cases to an institution would be a great waste of beds and money, and would result in a grave gap in their education at a time when education is of most value. There are, of course, teaching facilities at most institutions, but these cannot be compared with ordinary schooling. Finally such children would enjoy small privileges entailing the expenditure of public money on extra milk and treatment, which in many cases would be quite unnecessary.

It seems, therefore, that some modification of the existing tuberculosis scheme is now necessary. Positive reactions are undoubtedly potential sufferers from tuberculous meningitis, bone and joint tuberculosis, or adult phthisis; but since only a small fraction of them will develop these conditions, it is unnecessary to notify all cases of primary infection discovered.

The difficulty could be overcome by classifying the primary lesion separately so that its recognition carries none of the consequences of ordinary notification. It would probably be sufficient to keep such cases under supervision for a couple of years only, to tide them over the immediate danger period; after that they could be written off as "healed." Cases requiring institutional treatment at the outset but are likely to heal uneventfully should be admitted to special open-air schools, not shared by children with other illnesses, where they could be kept under careful medical supervision, away from the source of infection and without a break in education. At present there are few facilities for their reception: convalescent homes, perturbed by the TB+ gastric lavage will rarely accept them, and it is undesirable that they should be admitted to sanatoria with open cases.

It must be recognised that there are two types of case in which tubercle bacilli may be demonstrated: the primary infection with its tendency to regress and resolve; and adult phthisis with its tendency to progress and cavitate. The regulations should be so amended that notification of pulmonary tuberculosis is confined to the latter class.

Kettlewell Hospital, Swanley. ROBERT LIVINGSTONE.

THE WHITE PAPER REVIEWED

SIR,—I should like to endorse the view of the white-paper, and the concept of a national medical service, expressed so ably in your issue of May 6 by Dr. Hopkins. I am, I imagine, a contemporary of his, and I feel about it much as he does; he strikes the note which is all too seldom heard in the criticisms of the scheme and which were mentioned on April 22 by Dr. Mole—namely, the point of view of the patient and the people in general. That they are not served as they should be, under the present system, is surely clear; otherwise the state would not have felt impelled to interfere. If we have been unable to provide an adequate service for the whole community after all these years, can we grumble when the matter is taken out of our hands? Let us by all means amend the scheme as necessary; I am not attempting to say it is perfect in every detail. But let us at least admit that the Government has produced a very reasonable basis for a national medical service.

The criticism that the standard of medical practices will tend to fall in such a service uncovers a very low estimate of one's fellow men. The quality of a man's work depends on his idealism and the quality of work need not suffer in a state service in any degree more than that which each one of us allows it so to do. But, while this is perfectly true, we must be honest enough to admit that a large self-interest dominates idealism in most of our motives. To give a more complete service to the community we require a measure of control, and that control can be given by the state without undue interference. A free profession as we know it is an ideal which I believe we, as a whole, have shown ourselves unable to fulfil; and I, for one, am not afraid of the different freedom promised us in the comprehensive national medical service.

After four years in a state-run medical service I know something of the snags and dangers of bureaucratic control, but I believe that in a nation-wide scheme they would be less than is feared, and I also believe that, in the interest of the community we serve, we should be prepared to take that risk as well as sacrifice our present "freedom."

HUGH R. ARTHUR.

SULPHONAMIDES IN DERMATITIS HERPETIFORMIS

SIR,—As a contribution to the question raised by Dr. Barling in his article of April 15, I am reporting a case in which I deliberately applied unusually high doses. I had the patient in my care while I was working a year ago in the Halifax General Hospital under Mr. H. I. Deitch.

A red-haired boy aged 5 years had been an inpatient of the hospital continuously for more than half his life. During this time he had been seen by several distinguished dermatologists and pædiatricians who all diagnosed dermatitis herpetiformis. All treatments tried (Liq. arsen., 'German,' 'Aolan,' 'Livogen,' sulphanilamide ointment, calc. lact., orange juice, vitamin D 100,000 units daily, AT10, antidiphtheria serum, &c.) were completely in vain. The child's skin was covered all the time with weeping sores; for many months healing ulcers were at once replaced by new ones. As a consequence the boy's mental state became very poor and his behaviour completely apathetic. His condition seemed so bad and the outlook so hopeless that a heroic decision seemed justifiable. Our reasoning ran like this. As dermatologists agree, there is in all such cases an element of nervous instability. This was especially true for our little patient's skin, which was certainly highly sensitive and irritable. We thought that the most active irritant was the infected material discharged from the infected blisters on to the skin; this provoked new blisters, these became again infected, and so on. There was apparently a firmly fixed vicious circle which had to be broken if any improvement was to take place. This might be done by preventing secondary infection of the blisters. I tried to achieve this by saturating the exudated serum with a bacteriostatic sulphonamide, and chose

sulphadiazine (by far the least toxic of all sulphonamides) applied over a long period. The experiment proved successful. The boy had 3 grammes of sulphadiazine daily for a fortnight, 1·25 g. daily for the next four weeks, 0·75 g. for a fortnight, and then 0·375 g. daily. Altogether about 100 g. was given in two months. He made slow but definite progress and the weeping ulcers healed up. He became a lively and gay child and was soon out of bed all day, only now and then small blisters appeared on his skin which contained only serum and no pus. His mother asked to take him home, and we could allow him to go after the dramatic change the illness had taken.

I would like to end with two remarks. First, the child was not cured of his fundamental condition—in spite of sulphadiazine, new blisters appeared now and again. Secondly, sulphapyridine and also sulphadiazine had been tried several times during the years of his illness in the form of two or three day "courses" without effect. Sulphonamides are not harmless drugs to be given in every low-grade infection which heals up spontaneously (sore throat, upper respiratory infections, &c.), but if there is a real indication they should be used with courage and without the physician's mind being fixed on the rare event of agranulocytosis. Is the surgeon kept from performing an appendix operation because of the rare accidents which may happen, if the indications for the operation are well founded?

Perthshire. PAUL KAZNELSON.

RUBELLA AND CONGENITAL MALFORMATIONS

SIR,—I have read your annotation on p. 316 of March 4. Among the inaccuracies are the following:

(1) *Geographical.*
  (*a*) Dr. Gregg's work was performed in New South Wales.
  (*b*) There are no "states" in South Australia. South Australia (population about 600,000) is a state of the Commonwealth of Australia.
(2) *Medical.*
  Only one case, not "two," was described of congenital malformation following maternal mumps in pregnancy.

As far as the remainder of the annotation goes I hope that a few of your readers will find time to read the original articles for themselves.

Institute of Medical and Veterinary Science, Adelaide, S. Australia. CHARLES SWAN.

*** The articles to which Dr. Swan refers are by N. McA. Gregg (*Trans. ophthal. Soc. Aust.* 1941, 3, 35) and by C. Swan and others (*Med. J. Aust.* 1943, ii, 201). A further article is in course of publication in the latter journal.—ED. L.

THE LABORATORY TECHNICIAN

SIR,—Your article of April 29 (p. 575) suggests that the intermediate technical examination shall consist of subjects which would level out the standard of education of entrants, but already one of the generally accepted school certificates is required of candidates before they are registered as students of this Institute, on the same principle as that adopted by other qualifying bodies. It is realised that potential entrants will not always be in possession of such an educational standard, for the Institute, as yet, cannot and is not willing to control the recruitment of juniors into medical laboratories; and in these cases the proposed student is referred to the local educational authorities or, where facilities do not exist, to a recognised correspondence course. Only on the acceptance of their educational qualifications are they admitted to student membership of the Institute. They then continue their studies in the basic scientific subjects of physics, chemistry, biology and physiology, until, at the age of 18, they can commence the Institute tutorial classes.

Our instructional classes are to be conducted at many centres in the country, by fellows and associates of the Institute, in preparation for the Institute's diplomas. There is much to be said for your suggestion regarding the personal, as against the class, system of teaching during the professional training proper, provided that there is some standardisation of the quality of the teaching and also of the teaching methods, and my council have prepared their syllabus, and have chosen their instructors and tutors, so that this standard teaching shall exist. The periods of professional training are three years for the intermediate examination and a further two years for the subjects of the final examination—i.e., pathological technique, bacteriological technique and chemical pathology technique.

Institute of Medical Laboratory Technology, Buckingham Street, W.C.2. J. M. SIGNY, Secretary and Registrar.

THE BRIDGE IN GALL-BLADDER SURGERY

SIR,—Mr. Holman has questioned the usefulness of the bridge in gall-bladder surgery. It is difficult to see how the use of a bridge could affect the incidence of pulmonary embolism—its incidence is notoriously capricious. But on another count I believe its use is to be discouraged. Hyperextension of the lumbar spine is likely to be conducive to pain in that region afterwards, particularly in the type of patient who is most liable to suffer from gall-stones. I have not used a bridge in gall-bladder operations for the last twenty years, having learned from the late Lord Moynihan that it was quite unnecessary. His teaching that an adequate incision and proper use of the assistant's left hand would always provide an excellent exposure has seemed to me to be fully justified.

London. GEOFFREY KEYNES.

"Q" AND ANTIBODY

SIR,—Sir Arthur Quiller-Couch's book, *On the Art of Writing*, must have helped many to improve their scientific writings. In it he states, "But, though less important, it is good to recognise that, as sons of Cambridge, we equally offend against her breeding when in our scientific writings we allow ourselves to talk of a microbe as an 'antibody.'" The word, ugly as well as hybrid, did not convey to "Q" that its antibody fought the microbe.

Cannot we cease to offend against our breeding by coining a new word? Having learnt just enough Latin to pass the matriculation examination (alas, twenty-five years ago!) and no Greek, I will leave it to others to propose a word, but remind them of Quiller-Couch's advice, "Almost always prefer the direct word to the circumlocution." I sincerely hope some son of Cambridge will produce a single generic word for the chemical substances fighting in our blood and tissues. This will show our appreciation of "Q" who, as the obituary notice in the *Times* said, may not have founded a famous school but certainly helped the average man to rise above his mediocrity.

Rugby. R. E. SMITH.

SUPPLY OF BODIES FOR DISSECTION

SIR,—In Dr. Goodman's Arris and Gale Lecture, summarised in your issue of May 20, he expresses the belief that there will be a gradual falling off in the number of unclaimed bodies available. In this he is no doubt right, for when we are all insured against every contingency in life from the womb to the tomb and given in addition a handsome tip to Charon in the form of a burial allowance, few bodies are likely to be unclaimed. But is he not too sanguine in thinking that if the method of leaving bodies by bequest was better known the gap would rapidly be filled? Some years ago a friend of mine asked his executors to bequeath his body to a medical school, but the professor of anatomy did not jump at the offer on account of the tiresome formalities to be observed, although—my friend being an agnostic—there was no occasion for a burial service. In any case one need not be a sentimentalist to have qualms about handing over that old friend the body, which has served one pretty faithfully for perhaps 70 odd years, to be pickled in formalin, laid on a table and cut to shreds by the scalpels of a group of young men and women. Better by far for it to be picked to pieces by real vultures on the Towers of Silence like a Parsee!

No; the solution of the problem is not more corpses but less anatomy. Let us give up the fetish that the whole body must be dissected by every medical student, reduce drastically the amount of anatomical detail that he is expected to know, make more use of ready-prepared specimens, models and drawings, and call in the help of X rays used on the living subject, and also of the cinema as in the case of the Harvey film. Far fewer bodies would then be wanted. FRCP.

Obituary

JAMES JOSEPH DOCHERTY

M B GLASG; CAPTAIN RAMC

Captain James Docherty, who was killed in action on the Italian front in January, was the eldest son of Mr. and Mrs. Michael Docherty of Glasgow. He was educated at St. Aloysius' College, Glasgow, and at the University of Glasgow. After qualifying in 1940 he was invited to join the staff of the Southern General Hospital, where his promising work as a student was known. Dr. John Hewitt, one of his chiefs there, writes: "Docherty had already shown a skill and soundness of judgment unusual for one of his years. His death has ended his medical career before it had properly started, but nothing can destroy the memory of his calm unassuming efficiency and his grace and charm of manner." While one of his contemporaries assesses him as a man with a "flair for essentials and a happy knack of translating knowledge into action." Wiry and of medium build, Docherty had a breezy personality and a great capacity for friendship. His hobbies were music and photography, and he was a good golfer.

Lafayette

He was commissioned in November, 1941, and after a few months' service in Iraq was transferred to the 8th Army in which he served through the North African campaign. As a company commander of a field ambulance he went to Italy with the 5th Army and was killed during the fighting near Cassino. He was 27 years of age.

CALEB GREENWOOD PENNY

MRCS; CAPTAIN RAMC

Captain Penny, who has been killed in Burma at the age of 30, was the only son of Dr. R. A. Greenwood Penny, acting superintendent of Exminster Hospital. He was educated at Exeter School, University College of the South West, King's College, London, and St. George's Hospital, and qualified MRCS in 1941. After holding house-appointments at St. George's and at Exminster Hospital he joined the RAMC in 1942. A strongly built young man, Greenwood Penny was a vigorous and energetic Rugby player and captained his hospital team in 1940–41. Many of his fellow students will remember him, in a fisherman's jersey and a pair of old corduroy trousers, giving a running commentary from the roof of St. George's on the activity of the Luftwaffe. Here, as in other walks of life, his humour and fearlessness at once amused and encouraged his companions.

Vienna Studio, Bombay

Dr. WALDEMAR BARTHOLIN SOMMERS died at his home at Redhill, Surrey, on May 9, after a long illness. He came to Edinburgh from New Zealand to study medicine in 1902 and graduated MB with honours in 1908. After a year as house-physician to Professor Greenfield he was appointed medical officer to the Burmah Oil Company at Syriam. While on leave in 1914 he returned to Edinburgh and took his FRCSE. His health was never overrobust and at the end of his contract in 1925 he retired to Redhill. J. C. L. writes: "Bart Sommers started medicine rather later than the average student. Quiet and rather reserved, he did not make friends easily, but he was always helpful in advice, both professional and social, to those younger than himself. A sound physician he earned much gratitude and praise both from the officials and from the natives. He bore his illness with the philosophy and fortitude which those of us who knew him had come to expect."

Mr. HURRY FENWICK was born at North Shields in 1856, seven years before his father, Dr. Samuel Fenwick, migrated to London. He died in his 88th year.

Public Health

"Scarlet Fever"

For some months the Essex Epidemiological Committee—whose members include representatives of general practice, the public health service, and hospitals—has been considering the definition of "scarlet fever." After consultation with the Ministry of Health, it has asked its chairman, Dr. W. A. Bullough, MOH for the county, to circulate the following memorandum to local MOHs, hospital officers, and practitioners:

It is generally agreed that "scarlet fever" has become so benign as to make largely unnecessary its administrative control as previously exercised. It is recognised also that this condition is only one of the many manifestations of infection with group A hæmolytic streptococci and that there is no justification for isolating in hospital individuals suffering from streptococcal sore throat associated with a rash, whilst ignoring those with a similar sore throat and no rash. To do so does not protect the community, but it is impracticable to remove to hospital all those suffering from streptococcal sore throat and it follows that the needs of the particular patient should decide whether or no he should be given hospital accommodation.

Cross-infection, which is largely responsible for the complications of "scarlet fever," does not occur if the patient is nursed at home, and this is one of the main reasons for advocating home treatment of this disease wherever possible. Although the welfare of the patient is the first consideration, other aspects of the problem cannot be ignored, and one of these is the possibility of the spread of infection by milk or foods which are consumed uncooked, whilst another is the risk of infecting a woman in the later stages of pregnancy. Where, therefore, a case of "scarlet fever" occurs in a household, a member of which is a food-handler, or where there is a woman approaching confinement, it would be inadvisable to have the patient nursed at home. It is, therefore, recommended that admission (of cases of "scarlet fever") to hospital should be determined by: (1) the severity of the disease; (2) the home nursing facilities; (3) the employment of another member of the household in the preparation or distribution of food for public consumption; (4) the approaching confinement, say within one month, of any female in the patient's home.

It is highly desirable that the public should be informed of the altered view now taken by the medical profession of "scarlet fever," and it is felt that this can best be done by the family doctor.

Infectious Disease in England and Wales

WEEK ENDED MAY 13

Notifications.—The following cases of infectious disease were notified during the week: smallpox, 1 (at Birkenhead); scarlet fever, 1791; whooping-cough, 2548; diphtheria, 584; paratyphoid, 10; typhoid, 8; measles (excluding rubella), 2132; pneumonia (primary or influenzal), 704; puerperal pyrexia, 150; cerebrospinal fever, 70; poliomyelitis, 2; polio-encephalitis, 0; encephalitis lethargica, 4; dysentery, 280; ophthalmia neonatorum, 75. No case of cholera, plague or typhus fever was notified during the week.

The number of civilian and service sick in the Infectious Hospitals of the London County Council on May 10 was 1730. During the previous week the following cases were admitted: scarlet fever, 116; diphtheria, 48; measles, 62; whooping-cough, 63.

Deaths.—In 126 great towns there were 1 (0) deaths from an enteric fever, 2 (1) from scarlet fever, 4 (2) from measles, 14 (2) from whooping-cough, 7 (0) from diphtheria, 53 (7) from diarrhœa and enteritis under two years, and 14 (0) from influenza. The figures in parentheses are those for London itself.

Sheffield reported the fatal case of enteric fever. There were 3 deaths from whooping-cough at Birmingham.

The number of stillbirths notified during the week was 208 (corresponding to a rate of 25 per thousand total births), including 20 in London.

Notes and News

A CENTENARIAN NURSE

Mrs. Rebecca Strong, who died at the age of a hundred at Chester last month, was born at the Blue Boar in Aldgate in 1843. Left an orphan at an early age, she married young (her maiden name was Thorogood) and was left a widow with one daughter when she was twenty. Tales of the Crimea turned her mind to nursing, and she entered Florence Nightingale's pioneer school at St. Thomas's as one of the earliest probationers. After training she was chosen by Miss Nightingale to go with five or six other nurses to reorganise the nursing of Netley Military Hospital.

An offer of the post of matron at Dundee Royal Infirmary took her north in 1874, and five years later she became matron of the Royal Infirmary, Glasgow. Here things moved too slowly for her; when she suggested that a home should be built for the nurses the board felt she was going too far. She resigned, and started a private nursing-home, taking cases for William Macewen, then casualty surgeon to Glasgow City. Six years later the infirmary asked her to come back; she now found an enlightened board of management, and settled down there to achieve the advances in the education and status of nurses with which her name is associated.

In 1907 she retired; but after a few years she was up and doing again, engaged in active nursing propaganda. This took her to Finland, Palestine, Ceylon and the United States. In 1918 she was responsible for founding the Scottish Nurses' Club in Glasgow. Her last journey in the cause of her nurses was made at the age of 86, when somewhat to the consternation of her family (she was travelling quite alone) she visited Canada and made a lengthy tour.

Her interests were broad; she read widely in English and French, and for many years spent her holidays climbing in the Alps. On New Year's Day, 1939, she made her last public appearance, when she met the nurses and governors at the Glasgow Royal Infirmary. She received the OBE on the same day. Her hundredth birthday was no disappointment: she received deputations from her own and other hospitals, and greetings from the Royal Family, and later sat at the head of the table of her great-nephew, Dr. Charles Tisdall, and made a characteristic little speech of thanks.

University of Sheffield

The university has received from the J. G. Graves Charitable Trust £25,000 for establishing postgraduate research fellowships in medical sciences.

Royal College of Surgeons of Edinburgh

At a meeting of the college on May 18, with Prof. R. W. Johnstone, the president, in the chair, the following were admitted to the fellowship:

A. F. Anderson, MB EDIN.; D. M. Dunn, MB DURH.; James Garden, MB GLASG.; Clement Grimshaw, MB, EDIN.; H. I. J. Kellam, MD TORONTO; Alfred Standeven, MB CAMB.; and C. L. Thomas, MD TORONTO.

Exhibits in Edinburgh University Library

To illustrate Dr. Douglas Guthrie's lectures on the historical background to modern medicine, a collection of early printed medical books has been placed on view in the Upper Library Hall of Edinburgh University. It includes first editions of Vesalius's *De Corporis Humani Fabrica* (1543). and Harvey's *De Motu Cordis* (1628). The exhibition will remain open from May 29 to 31 (10 till 4).

British Medical Bulletin

The British Council has been permitted to print a small edition of *British Medical Bulletin* for sale in the United Kingdom. The primary purpose of the *Bulletin* is to interpret British medicine to the overseas reader: it contains reviews, abstracts, book notes and a list of the contents of current British medical and cognate journals. Applications for annual subscriptions or for single parts may be addressed to BMB, 3 Hanover Street, London, W.1.

Harveian Society of London

Surgeon Vice-Admiral Sir Sheldon Dudley will deliver the Harveian lecture on Monday, June 5, at 4 PM. He will speak on state medical service problems in the light of Royal Naval experience. The meeting will take place at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2.

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as an indication that they are necessarily available for export.

ON May 8 the Medical Society of London elected Mr. W. SAMPSON HANDLEY to its honorary fellowship, reviving this jealously guarded privilege as a recognition (in the President's words) of lifelong devotion to the advancement of surgery and of the application of pathology to practice.

Local Planning of Rehabilitation

Addressing a conference at Loughborough on May 3, Dr. Harold Balme, of the Ministry of Health, described rehabilitation as a medico-sociological problem, to be solved by medicine and industry in partnership. He hoped that social insurance would do away with lump-sum compensation, which was a serious deterrent to rehabilitation, and he looked forward to rehabilitation workshops throughout the country in which men would work until their earning capacity was restored. In each town a small joint council should be formed to find out how many people need rehabilitation and what facilities for it exist.

British Institute of Philosophy

At 5 PM, on Friday, June 2, at 14, Gordon Square, London, W.C.1, Prof. H. H. Price will give a lecture on two theories of perception.

Appointments

KELYNACK, AGNES V., MD LOND.: assistant secretary to the British Medical Association.
RIGGAL, R. M., LRCP: medical superintendent, Northumberland House, Finsbury Park, London, N.
SPARKS, J. V., MRCP, DMRE: consulting radiologist for Bristol.
SPIRO, I., MRCS: visiting ophthalmologist at Hillingdon County Hospital, Middlesex.
WILTON, B. J., MRCS: examining factory surgeon for Islington, Middlesex.

Births, Marriages and Deaths

BIRTHS

BARRETT.—On May 16, at Gerrards Cross, the wife of Lieutenant G. M. Barrett, RAMC—a daughter.
CURRIE.—On May 12, in Capetown, the wife of Major J. A. Currie, SAMC—a son.
D'SILVA.—On May 18, in London, the wife of Dr. John D'Silva—a son.
DONALDSON.—On May 15, in Edinburgh, to Dr. Nancy Donaldson (née Ferguson), the wife of Surgeon-Lieutenant E. M. Donaldson, RNVR—a son.
EDHOLM.—On May 16, the wife of Dr. O. G. Edholm, of Belfast—a daughter.
EVANS.—On May 17, at Llanelly, the wife of Surgeon Lieutenant A. J. Evans, RNVR—a daughter.
FYNN.—On May 14, at Cherwell, Oxford, the wife of Dr. Robert Fynn—a son.
GIBBS.—On May 15, at Cobham, Surrey, the wife of Dr. A. J. Gibbs—a son.
HENDERSON.—On May 16, in London, the wife of Dr. Norman P. Henderson—a son.
HUGH-JONES.—On May 16, at Poole, Dorset, the wife of Dr. Philip Hugh-Jones—a daughter.
LEMPERT.—On May 8, to Dr. Susan M. Lempert, wife of Dr. Hyme Lempert of Didsbury, Manchester—a daughter.
LISTER.—On May 13, at Twyford Bury, Bishop's Stortford, the wife of Lieut.-Colonel Arthur Lister, RAMC—a daughter.
PARKINSON.—On May 14, at Wanstead, the wife of Mr. Roy Parkinson, FRCS—a daughter.
TAYLOR.—On May 16, at Birmingham, the wife of Dr. A. Brian Taylor—a son.

MARRIAGES

ACKERLEY—GIBBINS.—On May 18, James Ackerley, captain RAMC, of Kersal, Manchester, to Joan Christine Gibbins.
DAWKINS—DAVIES.—On May 6, Robert Cecil Dawkins, group-captain RAF, to Joan Mary St. Venant Davies, MB.
GUTTMANN—ROSENBERG.—On May 18, in London, Eric Guttmann, MRCP, to Elizabeth Rosenberg, MRCP, major RAMC.
HARGREAVES—THOMSON.—On May 19, G. E. L. Hargreaves, paymaster captain RN, to Christina Thomson, MB, of Plymouth.
HAYWARD—PINE-COFFIN.—On May 9, in the Middle East, Edwin William Hayward, colonel RAMC, to Monica Pine-Coffin, section-officer WAAF.
MACKAY—HOOLE.—On April 20, at Port Said, S. James Craufurd Mackay, MD, to Sybil Mary Hoole, section-officer WRNS.
SMALL—WOOD.—On May 8, at Witney, Michael H. Small, surgeon lieutenant RNVR, to Margaret H. Wood, QARNNS (R).
WATKINS—CARINGTON.—On May 12, at Chenies, P. F. Anthony Watkins, lieutenant RAMC, to Alison Elrene Carington.

DEATHS

BANGAY.—On May 17, at Southsea, Hants, James Dorrington Bangay, OBE, MRCS, surgeon captain RN ret.
BURNEY.—On May 15, in London, Charles Dudley Francis Burney, MRCS
CAHILL.—On May 14, Robert John Cahill, DSO, MB RUI, DPH, lieut.-colonel RAMC retd.
COUSINS.—On May 10, at Almora, North India, Ethel Constance Cousins, MA OXFD, MD LOND.
FENWICKE.—During February, at Worthing, William Soltau Fenwicke, MD STRASBOURG & LOND., MRCP.
HALSTEAD.—On May 15, at Rickmansworth, Herts, Douglas Vernon Halstead, MRCS, formerly of Ramsgate, aged 54.
STANLEY.—On Dec. 1, at Malai Camp, Singapore, Cuthbert Arthur Stanley, MB LOND., DO, DTM, Colonial Medical Service.

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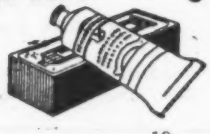

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Monday, 5th June	10 A.M.	Pathology of Jaundice ..	Dr. J. McMichael.
	11.30 A.M.	Mass Radiography: the New Approach to the Diagnosis of Pulmonary T.B.	Group Captain R. R. Trail.
	2 P.M.	Diagnosis of Malaria and Kala Azar.	
Tuesday, 6th June	10 A.M.	Avitaminoses	Dr. H. M. Sinclair.
	11.30 A.M.	Deficiency Diseases ..	Dr. H. M. Sinclair.
	2 P.M.	Psychiatric Problems in the Field.	Lieut.-Colonel T. F. Main.
Wednesday, 7th June	10 A.M.	The Louse	Prof. P. A. Buxton.
	11.30 A.M.	Typhus	Lieut.-Colonel J. W. Osborne.
	2 P.M.	Trench Fever	Prof. J. A. Nixon.
Thursday, 8th June	10 A.M.	Dysentery	Dr. A. L. Gregg.
	11.30 A.M.	Epidemiology of Jaundice	Colonel J. E. Gordon.
	2 P.M.	Poliomyelitis	Prof. H. J. Seddon.
Friday, 9th June	10 A.M.	Pneumonia	Col. W. S. Middleton.
	11.30 A.M.	Sulphonamides	Brig. L. E. H. Whitby.
	2 P.M.	Obscure Pyrexias	Major Stuart Harris.

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Neurological Clinic	Fridays, 11 A.M. ..	Dr. Purdon Martin and Mr. Knight.
Radiological Demonstration	Thursdays, 2 P.M. ..	Dr. E. J. Topham.
Skin Clinic	Thursdays, 2 P.M. ..	Dr. R. T. Brain.
Medical Clinic ..	Thursdays, 11 A.M. ..	Sir Adolphe Abrahams.
Radiotherapy ..	Mondays, 2 P.M. ..	Dr. Constance Wood.

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Monday, 19th June.

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(Pathology, Medicine, Surgery, and Midwifery)
Tuesday, 4th July.

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A Week-end Course on "Medical and Administrative Problems connected with the Re-settlement in Industry of the Disabled (ex-Service and Civilian)" will be held at the LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE on Saturday and Sunday, 8th and 9th July. The course is designed for industrial medical officers and other medical practitioners interested in the subject and the lecturers will include Dr. Harold Balme, Mr. R. E. Gomme, Dr. E. C. Warner, Mr. R. W. Watson-Jones, Dr. Aubrey J. Lewis, and Dr. Norman Tattersall.

Applications, together with the fee of 1 guinea and 2s. 6d. if lunch is required on the Sunday, should be sent to the Secretary of the School, Keppel-street, Gower-street, London, W.C.1, before Monday, 3rd July.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

LICENCE IN DENTAL SURGERY.

Notice is hereby given that the Examination for the Licence in Dental Surgery will commence on the date stated below :—

FINAL PROFESSIONAL EXAMINATION
Monday, 19th June.

Candidates who have complied with the necessary requirements and who desire to present themselves for examination must apply in writing to the Examination Hall, 8–11, Queen-square, London, W.C.1, at least 21 days before the date of the Examination, transmitting at the same time such certificates as may be required by the regulations, together with the full amount of the fee due for the part or parts which they desire to enter. HORACE H. REW, Director of Examinations.

L. M. S. S. A.

FINAL EXAMINATION: SURGERY, June 12th, July 10th, August 14th, 1944; MEDICINE, PATHOLOGY, June 19th, July 17th, August 21st, 1944; MIDWIFERY, June 20th, July 18th, August 22nd, 1944; MASTERY OF MIDWIFERY EXAMINATIONS, May and November.

For regulations apply REGISTRAR, Apothecaries' Hall, Black Friars-lane, London, E.C.4.

THE QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, E.2. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE PHYSICIAN (A), vacant 1st July, 1944. Appointment will be for 6 months. Salary at rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Application forms may be obtained from the undersigned and should be returned, with copies of not more than 3 testimonials, on or before 3rd June, 1944.

CHARLES H. BESSELL, General Secretary.

THE QUEEN ELIZABETH HOSPITAL FOR CHILDREN (Country In-patient Branch 70 Beds), ASHENDENE, BAYFORD, HERTS. Applications are invited from registered medical practitioners, Male and Female, including R and W practitioners now holding A posts, for the appointment of RESIDENT MEDICAL OFFICER (B2), vacant 1st July, 1944. The appointment will be for 6 months. Salary is at rate of £200 p.a., with full residential emoluments.

Application forms may be obtained from the undersigned and should be returned, with copies of not more than 3 testimonials, on or before 3rd June, 1944.

CHARLES H. BESSELL, General Secretary.
Queen Elizabeth Hospital, Hackney-road, E.2.

THE SALVATION ARMY. The Mothers' Hospital, Clapton, E.5. Applications are invited from medical Women for the post of JUNIOR RESIDENT MEDICAL OFFICER (B2), vacant 1st June. Salary £110 p.a., with board, residence, and laundry. The appointment is for 6 months. W practitioners who now hold A posts may also apply.

Applications, with testimonials, to be sent to the Secretary-Superintendent.

WEIR HOSPITAL, Weir-road, Balham, S.W.12. Applications are invited from registered medical practitioners (Female) for the appointment of RESIDENT HOUSE SURGEON (B2), vacant the end of May. Salary is at the rate of £200 p.a., with full residential emoluments. W practitioners who now hold A posts may apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be sent to the Honorary Secretary-Superintendent.

WESTERN OPHTHALMIC HOSPITAL, 155, Marylebone-road, N.W.1. Applications are invited from registered medical practitioners, Male or Female, for the appointment of HOUSE SURGEON (B2), vacant 1st July, 1944. The appointment is for 6 months. Salary is at the rate of £150 p.a., with full residential emoluments. R and W practitioners holding A posts may apply.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent as soon as possible and not later than 12th June to: ARTHUR E. TYLER, Secretary.

METROPOLITAN HOSPITAL, London, E.8. Applications are invited for the post of a TEMPORARY HONORARY SURGEON to the above Hospital. Applicants must be Fellows of the Royal College of Surgeons.

Particulars of the appointment can be obtained from—
FRANK JENNINGS, House Governor and Secretary.

HAMPSTEAD GENERAL HOSPITAL, N.W.3. Applications are invited from registered medical practitioners, Male and Female, for the appointment of CASUALTY SURGICAL OFFICER (B2), Out-patient Department, Camden Town, N.W.1, vacant 1st June, tenable for 6 months. Salary £100 p.a., plus allowance at £50 p.a. for duties in connexion with First-aid Post established there, with board, lodging, and laundry. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be downgraded temporarily to A. Practitioners qualified for more than 3 months and liable under the National Service Acts (males must be rejected by R.A.M.C.) may also apply.

Applications on the prescribed form, with copies of 3 testimonials, to be returned not later than the 31st May.

KENNETH A. F. MILES, House Governor.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, LONDON, W.C.1. There is a vacancy for an ANÆSTHETIST. The appointment, which is to the visiting medical staff, will, in the first instance, be limited to the period of the war. Candidates must be registered medical practitioners and preference will be given to those who hold the Diploma in Anæsthetics.

Forms of application, which must be returned by the 31st of May, 1944, and further particulars are obtainable from—
May, 1944. H. F. RUTHERFORD, Secretary.

MILLER GENERAL HOSPITAL, Greenwich High-road, S.E.10. Applications are invited from registered medical practitioners, Male, for the resident appointment of FRACTURE OFFICER (B1) for Out-patient Fracture Clinic, vacant 29th May, 1944. Duties will include work in the Rehabilitation Department. Preference will be given to candidates who have had previous experience in dealing with fractures. Salary at the rate of £250 p.a., with the usual residential emoluments. Suitably qualified R practitioners holding B2 appointments, also those now holding B1 and rejected by the R.A.M.C., may apply.

Applications, giving full particulars, together with copies of 3 recent testimonials, to be sent as soon as possible to—
11th May, 1944. L. G. BAIN, Acting Secretary.

BOROUGH OF WALTHAMSTOW. Education Committee ASSISTANT SCHOOL MEDICAL OFFICER (Temporary). Applications are invited from registered medical practitioners who are exempt from military service for the above whole-time appointment. The scale salary is £600 p.a., rising by £25 p.a. to £700 p.a., plus cost-of-living bonus at the rate of £33 17s. 10d. p.a., plus car allowance. The commencing salary will be at a point on the scale according to experience. The person appointed may be required to assist at the Council's Day Nurseries, Child Welfare Clinics, Infectious Disease and/or Maternity Hospitals. Suitable experience will, therefore, be an advantage.

Applications must be made on the approved form obtainable from the undersigned, to whom it must be returned by NOON on Saturday, 10th June, 1944.

E. GWYN THOMAS, Director of Education.
Town Hall, Forest-road, Walthamstow, 12th May, 1944.

NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W.1. Applications are invited from registered medical practitioners, Male and Female, for the appointment of CASUALTY OFFICER (A), vacant 15th June. The appointment will be for a period of 6 months. Salary £120 p.a., with board, residence, and laundry allowance. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications, stating qualifications, age, &c., with copies of not more than 3 testimonials, should be sent before 8th June addressed to the Secretary.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, S.W.3. Applications are invited for the following appointments from registered medical practitioners, Male and Female, including R and W practitioners who now hold A posts :—

ASSISTANT RESIDENT MEDICAL OFFICER (B2). Experience in artificial pneumothorax essential, and in ear, nose, and throat work desirable. Salary at the rate of £150 p.a., with board and residence. The appointment is for 6 months, commencing 1st August, 1944.

HOUSE PHYSICIANS (B2), for which there are 3 vacancies. The duties include work in the Out-patient Department as well as in the wards, and the appointment is for 6 months, commencing 1st August, 1944, with an honorarium of £50 and board and residence.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 1 or more recent testimonials, should reach the undersigned not later than Saturday, 10th June, 1944.

Brompton, May, 1944. F. G. ROUVRAY, Secretary.

LONDON LOCK HOSPITAL, Out-patient Department, 91, Dean-street, W.1. Applications are invited for the appointment of TEMPORARY HONORARY SURGEON, for attendance at the Male Clinics one afternoon each week. The in-patient Hospital is closed for duration of the war. In accordance with war-time practice, the appointment will be temporary only. Applicants should preferably be Fellows of the R.C.S., England.

Applications, with testimonials, should be sent to the Secretary of the Hospital (from whom any further information can be obtained) by 8th June. The Medical Committee meets 14th June for interview (by invitation) and the appointment will be made at the Board Meeting on 6th July.

MIDDLESEX COUNTY COUNCIL. Middlesex Colony, Certified INSTITUTION, SHENLEY, near ST. ALBANS. Applications are invited from registered medical practitioners, Male or Female, not liable for war service, for the post of ASSISTANT MEDICAL OFFICER (B1). Salary from £460 to £660 p.a., according to qualifications and experience (plus bonus, now £22 2s. p.a.), with meals, laundry, and furnished accommodation. The appointment will be in a temporary capacity, and determinable by 3 months' notice on either side.

Applications, with copies of not more than 3 recent testimonials, should be addressed to the undersigned, and state earliest date when available for duty. A medical examination may be required.

C. W. RADCLIFFE, "B3," Clerk of the County Council.
Middlesex Guildhall, Westminster, S.W.1.

THE CHILDREN'S HOSPITAL, Sunderland. (50 Beds in active use.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A) and HOUSE PHYSICIAN (A), now vacant. The appointment will be for a period of 6 months. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

M. J. HUNTLEY, House Governor and Secretary.

ROYAL INFIRMARY, Preston. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A) to the Eye, Ear, Nose, and Throat Department (which has separate Wards and Out-patient Clinics). The appointment, which is recognised for the D.O.M.S. and D.L.O. examinations, becomes vacant on the 6th June. Salary at the rate of £150 p.a., with the usual residential allowances. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications forthwith to the Superintendent and Secretary, Royal Infirmary, Preston.

HIS MAJESTY'S COLONIAL SERVICE

THE COLONIAL MEDICAL SERVICE

VACANCIES FOR MEDICAL OFFICERS

The maintenance of an efficient Colonial Medical Service constitutes a vital part of the national war effort and it is most important that the Service should be assured of an adequate supply of doctors.

The Secretary of State for the Colonies therefore invites applications from doctors possessing a medical qualification registrable in the United Kingdom who are British subjects and who are under thirty-five years of age.

Medical Officers are appointed in the first instance for general service. But there are ample opportunities for work in special branches of medicine and surgery, in public health and in medical research.

The normal salary scale is from £600 to between £1,000 and £1,120. There are large numbers of super-scale posts to which promotion is made on merit and which carry higher salaries.

Government quarters, in many cases free of rent, and first-class passages to and from the Colonies are provided, and an adequate pension scheme is in force.

Selected candidates are normally required to attend a course of instruction in Tropical Medicine and Hygiene either before proceeding overseas or during their first period of leave.

Further particulars, including the regulations governing admission to the Colonial Medical Service, may be obtained from the Director of Recruitment (Colonial Service), 2, Park-street, London, W.1.

COUNTY OF LINCOLN—PARTS OF LINDSEY. Public Health DEPARTMENT, COUNTY INFIRMARY, LOUTH, LINCS. Applications are invited from registered medical practitioners, Male or Female, for appointments as RESIDENT MEDICAL OFFICERS (B2). Salary at the rate of £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when appointments will be limited to 6 months; otherwise not exceeding 1 year.

Applications should be sent as soon as possible to the Surgeon and Medical Superintendent, County Infirmary, Louth, Lincs. Testimonials should not be sent, but applications should give full particulars of the candidate together with the names of 2 persons to whom reference can be made.

County Offices, Lincoln, 18th May, 1944.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL, SOUTHAMPTON. (255 Beds.) Applications are invited from registered medical practitioners, Male and Female, including R and W practitioners who now hold A posts, for the appointment of RESIDENT ANÆSTHETIST (B2), now vacant. The appointment is recognised for D.A., and will be for a period of 6 months. The salary is at the rate of £175 p.a., with full residential emoluments.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be sent immediately to—

EDWARD L. WIRGMAN, House Governor and Secretary.

CAMBRIDGESHIRE COUNTY COUNCIL. County Hospital, CAMBRIDGE. (278 Beds.) Applications are invited for the posts of HOUSE SURGEON (A) and HOUSE PHYSICIAN (A), Male or Female, at the above Institution. Salary £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for 6 months; otherwise for 12 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of recent testimonials, should be sent at once to the Clerk of the Cambridgeshire County Council, Shire Hall, Castle Hill, Cambridge.

16th May, 1944.

UNIVERSITY OF BRISTOL. The University invites applications for the post of RESEARCH ASSISTANT to the Professor of Medicine. Salary £500 p.a.

Applications should reach the undersigned, from whom further particulars may be obtained, on or before 26th June.

WINIFRED SHAPLAND, Secretary and Registrar.

COUNTY MENTAL HOSPITAL, Prestwich, Manchester. 2 Tem-PORARY ASSISTANT MEDICAL OFFICERS (B1) required. Salary £600 p.a., rising to £650 p.a., plus war bonus. R practitioners holding B2 posts, also those holding B1 and rejected by the R.A.M.C., may apply.

Apply to the Medical Superintendent.

COUNTY BOROUGH OF NEWPORT, Social Welfare COMMITTEE. Applications are invited from registered medical practitioners, Male or Female, for the temporary appointment of JUNIOR RESIDENT MEDICAL OFFICER (A) at Wooloston House Emergency Hospital, Newport, Mon. Salary £150 p.a., with full residential emoluments. All fees, with the exception of coroners' fees, are payable to the Social Welfare Committee. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointment will be for a period of 6 months; otherwise for a period of 12 months.

Applications, accompanied by copies of 2 recent testimonials, should be sent at once to: TOM KAY, Director of Social Welfare, Town Hall, Newport, Mon.

CITY AND COUNTY OF BRISTOL. Dept. of Public Health, SOUTHMEAD HOSPITAL. Applications are invited from registered medical practitioners for the appointment of RESIDENT TEMPORARY OBSTETRICS REGISTRAR (B1) at Mortimer House, approved annexe to Southmead Hospital (recognised teaching department of Medical School). Applicants should have had previous experience of obstetrics. The salary is £300 p.a. Suitably qualified R and W practitioners holding B2 posts, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications to be made forthwith to the Medical Officer of Health, Kenwick Lodge, Westbury Park, Bristol, 6.

COUNTY BOROUGH OF SOUTHEND-ON-SEA. Applications are invited from registered medical practitioners, Male and Female, including R and W practitioners who now hold A posts, for the appointment of RESIDENT ASSISTANT MEDICAL OFFICER, Grade II (B2), at the Southend Municipal Hospital, Rochford, Essex. Previous experience in the administration of anæsthetics is essential. The salary is at the rate of £325 p.a., with full residential emoluments, plus war bonus. The person appointed will be liable to pay superannuation contributions if the provisions of the Local Government Officers' Superannuation Acts are applicable. To R or W practitioners the appointment will be limited to 6 months; otherwise for a period of 1 year and subject to 1 month's notice on either side.

Application forms, obtainable from the Medical Superintendent, Southend Municipal Hospital, Rochford, Essex, should be returned not later than 10th June, 1944. H. J. WORWOOD,

Town Clerk's Office, Southend-on-Sea. Town Clerk.

HAYMEADS EMERGENCY HOSPITAL, Bishop's Stortford, HERTS. Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

HOUSE SURGEON (B2). Salary is at the rate of £200 p.a. R and W practitioners now holding A posts may apply, when appointment will be limited to 6 months.

HOUSE SURGEON (A). Salary is at the rate of £150 p.a. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Full residential emoluments payable in each case.

Apply to Medical Superintendent, Haymeads Emergency Hospital, Bishop's Stortford, Herts.

GATESHEAD MENTAL HOSPITAL, Stannington, near Morpeth, NORTHUMBERLAND. Applications are invited from registered medical practitioners for the post of TEMPORARY ASSISTANT MEDICAL OFFICER (B1). Salary £450 and emoluments. Accommodation can be provided for a married man. Suitably qualified R practitioners holding B2 appointments, also those now holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating age, qualifications, and experience, to be sent as soon as possible to the Medical Superintendent as above. J. W. PORTER, Clerk to the Council.

THE DUCHESS OF YORK HOSPITAL FOR BABIES, MANCHESTER, 19. (80 Cots.) Applications are invited from medical practitioners (Male and Female) for the post of JUNIOR RESIDENT MEDICAL OFFICER (A). Salary at the rate of £100 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply. Appointment will be for a period of 6 months, from 1st July, 1944.

Applications, accompanied by copies of 3 recent testimonials, to be sent immediately to: LOUISE GILLESPIE, Secretary.

NAPSBURY HOSPITAL, near St. Albans, Herts. Assistant MEDICAL OFFICER (B1) locum tenens, Male, wanted. Salary £8 8s. per week, plus war bonus and emoluments of board, lodging, washing, and attendance.

Applications to Acting Medical Superintendent.

VICTORIA HOSPITAL, Accrington. Applications are invited from registered medical practitioners, Male, for the appointment of a HOUSE PHYSICIAN (A) at a salary of £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be limited to 6 months.

Applications, with copies of testimonials, to Honorary Secretary, Victoria Hospital, Accrington.

MONTAGU HOSPITAL, Mexborough, Yorks. (123 Beds.) Applications are invited from registered medical practitioners, Male, for the appointment of HOUSE SURGEON (A), now vacant. Commencing salary at the rate of £200 p.a., with usual residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of 6 months.

Applications to: A. W. YOUNGS, Secretary-Superintendent.

CAMBORNE-REDRUTH GENERAL HOSPITAL, Redruth, CORNWALL. Applications are invited for the post of HONORARY OPHTHALMIC SURGEON. Candidates should be suitably experienced in ophthalmology and possess the Fellowship of the Royal College of Surgeons.

Full particulars on application to the Secretary.

SURREY COUNTY COUNCIL. Public Health Department. ST. HELIER COUNTY HOSPITAL, CARSHALTON. Applications are invited from registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER (B1) to the Chest Block (56 Beds) at the above Hospital. In addition to these duties, the officer appointed will take charge under the Surrey County Council Tuberculosis Scheme of a dispensary sub-area adjacent to the Hospital. In both these functions he will be under the general control of the Tuberculosis Officers of the area and the Medical Superintendent of the Hospital.

The appointment is normally tenable for a period of 5 years, but in the first instance will be temporary for the further duration of the war and subject to 1 month's notice on either side; Local Government Superannuation rights will be preserved.

Applications from R practitioners now holding B1 appointments cannot be considered unless they have been rejected by the R.A.M.C.

The salary is at the rate of £550 p.a., plus full residential emoluments valued at £125 p.a., or if non-resident payment in cash in lieu thereof.

Applications to the County Medical Officer, County Hall, Kingston-upon-Thames, by the 7th June, 1944.

CAERNARVONSHIRE AND ANGLESEY INFIRMARY, Bangor. (General Hospital.) HOUSE SURGEON (A) and HOUSE PHYSICIAN (A) (Male or Female) wanted. Salaries respectively £160 and £140 p.a., with residence, board, and laundry. Duties to commence as soon as possible. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for 6 months; otherwise not exceeding 1 year.

Applications, stating age, qualifications, and nationality, with 2 testimonials, to be addressed to the Secretary.

ROYAL LANCASTER INFIRMARY, Lancaster. (311 Beds.) (Hospital recognised by the Royal College of Surgeons (England) for 2 Senior Posts.) Applications are invited from registered medical practitioners, Male and Female, for the post of ORTHOPÆDIC AND CASUALTY HOUSE SURGEON (B2), now vacant. The salary is at the rate of £175 p.a., with full residential emoluments. R and W practitioners holding A posts may apply, when the appointment will be limited to 6 months; otherwise may be extended. C. H. GRIMSHAW, Superintendent-Secretary.

WARRINGTON INFIRMARY AND DISPENSARY. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), now vacant. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Apply immediately to the Superintendent and Secretary, stating age, experience, and enclosing copies of 3 recent testimonials.

CITY OF PLYMOUTH. Didworthy Sanatorium, South Brent DEVON. (140 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of NON-RESIDENT MEDICAL OFFICER (B2). Preference will be given to candidates with some experience in the treatment of pulmonary tuberculosis. The person appointed will be required to work under the direct supervision of the Medical Superintendent. The salary is at the rate of £500 p.a. Residential quarters can be obtained in the near neighbourhood. The appointment may be terminated by 1 month's notice on either side at any time. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months; otherwise not exceeding 1 year.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of not more than 3 recent testimonials, should be sent as soon as possible to—

T. PEIRSON, Medical Officer of Health.

Seven Trees, Lipson-road, Plymouth.

LANCASHIRE COUNTY COUNCIL. County Hospital, Whiston, PRESCOT, near LIVERPOOL. Appointment of 2 RESIDENT MEDICAL OFFICERS (B2). Applications are invited from registered medical practitioners, Male or Female, for the above appointments, including R and W practitioners who now hold A posts. Salary is at the rate of £250 p.a., plus a cost-of-living bonus and full residential emoluments. To R or W practitioners the appointment will be limited to a period of 6 months; otherwise the successful applicants will be eligible for reappointment for a further period of 6 months.

Forms of application from the County Medical Officer of Health, Hospital and Medical Department, County Offices, Preston, to whom all applications must be forwarded to arrive not later than Monday, the 5th June, 1944.

GEORGE ETHERTON, Clerk of the County Council.

County Offices, Preston, 19th May, 1944.

ROYAL VICTORIA INFIRMARY, Newcastle upon Tyne. Surgical REGISTRAR (B1) (open appointment). Applications are invited from registered medical practitioners for the above appointment to the Royal Victoria Infirmary from 1st August, 1944. Applicants should have held house appointments. The post is suitable for applicants wishing to study for the Fellowship examination. Salary is at the rate of £300 p.a. (non-resident). Suitably qualified R and W practitioners holding B2 posts, also R practitioners now holding B1 and rejected by the R.A.M.C., may apply.

Applications should be sent not later than 10th June, 1944, to: A. W. SANDERSON, House Governor.

19th May, 1944.

THE GUEST HOSPITAL, Dudley. (The Resident Staff consists of a Resident Surgical Officer and 2 House Surgeons.) Applications are invited from registered medical practitioners, Male and Female, including R and W practitioners who now hold A posts, for the appointment of CASUALTY HOUSE SURGEON (B2), vacant 21st June. To R and W practitioners the appointment will be limited to 6 months. The salary is at the rate of £200 p.a., with full residential emoluments.

H. RAYMOND HURST, House Governor and Secretary.

BOROUGH OF CHEPPING WYCOMBE. High Wycombe. The Council invite applications for the temporary appointment of MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER for the Borough at a salary of £1000 p.a., plus any cost-of-living bonus from time to time made applicable. The Council are a Welfare and Part III Education Authority and own and administer a modern Health Centre, Child Welfare Services, Municipal Maternity Home, Antenatal Home, Sick Bay, 7 Wartime Nurseries, 14 Schools, School Clinic, and Dental and Child Guidance Clinics. Other medical staff is employed. The appointment will be subject to (*a*) the approval of the Minister of Health; (*b*) the satisfactory passing of a medical examination; and (*c*) the provisions of the Local Government Superannuation Act, 1937. The person appointed will be required to devote the whole of his time to the duties of the office and to perform all the duties imposed upon him by the Minister of Health, the Board of Education, and the Council.

Applications, stating age, qualifications, and experience, together with copies of 3 recent testimonials, must reach the undersigned endorsed "Medical Officer of Health" not later than the 19th June, 1944. Canvassing prohibited.

PHILIP B. BEECROFT, Town Clerk.

Municipal Offices, High Wycombe, May, 1944.

COUNTY BOROUGH OF BLACKBURN. Applications are invited from medical Women for the temporary post of ASSISTANT MEDICAL OFFICER OF HEALTH whose duties will be concerned mainly with Maternity and Child Welfare. The salary will be £600 p.a., rising by annual increments of £25 to a maximum of £700 p.a., plus cost-of-living bonus, at present £49 10s. 9d. p.a. In fixing the commencing salary within the scale regard will be had to previous experience. Candidates must have had 3 years' postgraduate medical experience, together with special experience of midwifery and antenatal work. Possession of the D.P.H. and/or experience in the diagnosis, &c., of venereal diseases though not essential are desirable. The consent of the Minister of Health has been obtained to the making of this appointment.

Forms of application may be obtained from the Medical Officer of Health, Public Health Department, Victoria-street, Blackburn, and should be returned to him as soon as possible, and in no case later than Saturday, the 10th of June, 1944.

CHAS. S. ROBINSON, Town Clerk.

EAST RIDING COUNTY COUNCIL. Driffield Emergency HOSPITAL. (360 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE SURGEON (B1), vacant immediately. Hospital provides experience in general surgery and gynæcology. Salary at the rate of £275–£350 p.a., with full residential emoluments according to experience. The appointment will be limited to a term not exceeding 1 year and is not renewable. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating age, qualifications, and previous experience, should be forwarded to—

T. STEPHENSON, Clerk of the Council.

County Hall, Beverley, 20th May, 1944.

COVENTRY AND WARWICKSHIRE HOSPITAL. Applications are invited from registered medical practitioners, Male and Female, including R and W practitioners who now hold A posts, for the appointment of HOUSE SURGEON (B2) for general surgical duties, vacant immediately. The appointment is for 6 months. Salary at the rate of £150 p.a., plus £20 p.a. cost-of-living bonus, together with full residential emoluments.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent immediately to—

S. CECIL HILL, House Governor and Secretary.

CITY OF BIRMINGHAM MENTAL HOSPITAL, Winson Green, BIRMINGHAM, 18. Applications are invited (Male or Female) for the post of TEMPORARY RESIDENT ASSISTANT MEDICAL OFFICER (B1). Salary £350, rising by annual increments of £25 to £450, with full residential emoluments, plus £50 for the D.P.M., and war bonus value £37 2s. 4d. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, with testimonials, to be sent immediately to the Medical Superintendent.

WORCESTER ROYAL INFIRMARY. Applications are invited for the position of HOUSE SURGEON (A), now vacant. The salary will be at the rate of £120 a year, with board and residence. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, with copies of not more than 3 testimonials, should be sent to—

HAROLD WIGG, Acting Superintendent-Secretary.

MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of OUT-PATIENT MEDICAL OFFICER. Successful candidate will be required to undertake morning work in the Out-patient Department. Applicants must be registered medical practitioners and possess a good knowledge of refraction work. Salary £300 p.a., 6 mornings per week.

Applications, giving qualifications and age, accompanied by 3 recent testimonials, should be sent to the General Superintendent.

CITY AND COUNTY OF NEWCASTLE UPON TYNE. NEWCASTLE GENERAL HOSPITAL. (900 Beds.) SHOTLEY BRIDGE EMERGENCY HOSPITAL. (900 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointments of HOUSE PHYSICIANS (A) and HOUSE SURGEONS (A), shortly vacant. The appointments will be for a period of 6 months. Salary at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply.

Applications to be forwarded to the Medical Officer of Health, Town Hall, Newcastle upon Tyne, 1.

THE STAMFORD, RUTLAND AND GENERAL INFIRMARY. Applications are invited from registered medical practitioners, Male and Female, for the appointment of RESIDENT ANÆSTHETIST (B2), now vacant. The salary is at the rate of £350–£400 p.a., according to experience of applicant, with full residential emoluments. R and W practitioners who now hold A posts may apply, when appointment will be limited to 6 months; otherwise for a period of 3 months.

Applications, stating age, qualifications with dates, nationality, and accompanied with copies of 3 recent testimonials, should be sent immediately to: H. F. DONALD, Secretary.

SALISBURY GENERAL INFIRMARY. (Voluntary Hospital—225 Beds.) Applications are invited from registered medical practitioners for the appointment of 2 HOUSE SURGEONS (A), vacant now. Salary at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of 6 months.

Applications, stating age, nationality, qualifications, and experience, together with copies of recent testimonials, should be sent to: JOHN WILLIAMS, Superintendent and Secretary.

SURREY COUNTY COUNCIL. Kingston County Hospital, Wolverton-avenue, KINGSTON-ON-THAMES. (Approximately 500 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A). Salary at the rate of £120 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, stating age and experience, and enclosing copies of 3 testimonials, should be sent to the Medical Superintendent by 31st May, 1944.

OLDHAM ROYAL INFIRMARY. Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), vacant immediately. The salary is at the rate of £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, and the appointment will be for a period of 6 months.

Applications, together with copies of 3 recent testimonials, to be submitted to—

F. W. BARNETT, General Superintendent and Secretary.

BLACKBURN AND EAST LANCASHIRE ROYAL INFIRMARY. (248 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the appointment of HOUSE SURGEON (A), vacant at present. Salary is at the rate of £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent as early as possible to—

T. DEWHURST, General Superintendent and Secretary.

Royal Infirmary, Blackburn.

THE BOLTON ROYAL INFIRMARY. (270 Beds—Resident Medical Staff, 6.) Applications are invited from registered medical practitioners, Male and Female, for the appointments of 3 HOUSE SURGEONS (A), one post now vacant, the second vacant 6th July, and the third on 29th July. Salary £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when any of the appointments will be for a period of 6 months.

Applications, stating age, nationality, experience, and post preferred, together with copies of testimonials, to be forwarded to: JOSEPH GRIFFITH, Superintendent-Secretary.

VICTORIA HOSPITAL, Burnley. (169 Beds.) Applications are invited from registered medical practitioners for the appointment of 2 HOUSE SURGEONS (A), now vacant.

The salary in each case is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointments will be for a period of 6 months.

Applications to be sent to: J. E. WHEATCROFT, Secretary.

BODMIN EMERGENCY HOSPITAL. Applications are invited from registered medical practitioners, Male or Female, for the appointment of RESIDENT HOUSE SURGEON (B2). The salary is at the rate of £200 p.a., with full residential emoluments. R and W practitioners holding A posts may also apply, when appointment will be limited to 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 (recent) testimonials, should be sent to the Medical Superintendent, Bodmin Emergency Hospital, Bodmin, Cornwall, as soon as possible.

SWANSEA GENERAL AND EYE HOSPITAL. Applications are invited from registered medical practitioners for the temporary appointment of RADIOTHERAPIST (who will also be required to assist in Radiodiagnostic work). Salary £850 p.a., non-resident. Applicants must hold a Diploma in Radiotherapy and Radiodiagnosis. The successful candidate will be required to devote whole time to the service of the Hospital and will have the right to treat private patients in the Hospital, by arrangement, on terms to be agreed with the Board, but will not be permitted to undertake private practice outside the Hospital.

Applications, stating age, qualifications, nationality, and full particulars of previous appointments held, to be forwarded to—

O. C. HOWELLS, Secretary-Superintendent.

WEYMOUTH AND DISTRICT HOSPITAL, Weymouth, Dorset. Applications are invited from registered medical practitioners for appointment of HOUSE SURGEON (B2), now vacant. The appointment is open to Male or Female candidates and is for a period of 6 months at a salary of £200 p.a., with full residential emoluments. R and W practitioners holding A posts may also apply.

Applications to be addressed as soon as possible to the Secretary-Superintendent of the Hospital.

LEIGH INFIRMARY, Lancs. (General Hospital—102 Beds.) Applications are invited from registered medical practitioners, Male and Female, for the following appointments:—

HOUSE SURGEON (A), shortly vacant. Salary is at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months; otherwise for a period of 12 months. Applications from friendly alien practitioners are also invited.

RESIDENT SURGICAL OFFICER (B1), vacant immediately. Applicants should have held house appointments and had surgical experience. Preference will be given to candidates holding diploma of F.R.C.S. Salary is at the rate of £400 p.a. Suitably qualified R and W practitioners holding B2 appointments, also R practitioners holding B1 and rejected by the R.A.M.C., may apply.

Applications, stating age and accompanied by copies of 3 testimonials, to be addressed to: F. M. EVISON, Acting Secretary.

CITY OF NORWICH. Woodlands Hospital. (311 Beds.) Applications are invited from registered medical practitioners for the appointment of ASSISTANT RESIDENT MEDICAL OFFICER (B2), vacant 1st July, 1944. The salary is at the rate of £250 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months; otherwise to 1 year.

Further particulars of appointment to be obtained from the Senior Medical Officer, Woodlands Hospital, Bowthorpe-road, Norwich, and to whom applications should be sent.

BERNARD D. STOREY, Town Clerk.

City Hall, Norwich, May, 1944.

HEREFORDSHIRE GENERAL HOSPITAL, Hereford. (210 Beds.) Applications are invited from registered medical practitioners, including practitioners within 3 months of qualification and liable under the National Service Acts, for the appointment of JUNIOR HOUSE SURGEON (A), including House Surgeon to Ear, Nose, and Throat Department. The appointment will be limited to 6 months. Salary is at the rate of £150 p.a., with full residential emoluments.

Applications, stating age, qualifications, and nationality, and accompanied by copies of 3 recent testimonials, should be sent to: T. W. UPTON, Secretary.

MARGATE AND DISTRICT GENERAL HOSPITAL. (100 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT MEDICAL OFFICER (A). Salary is at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when appointment will be for a period of 6 months.

Applications should be sent immediately to the Secretary.

ROYAL ISLE OF WIGHT COUNTY HOSPITAL, Ryde, I.W. Applications are invited from registered medical practitioners, either sex, for the appointment of HOUSE SURGEON (B2), now vacant. The appointment will be for 6 months. Salary at the rate of £180 a year, with board, residence, and laundry. As this is the senior post, previous surgical experience is advisable. R and W practitioners holding A posts may apply.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent without delay to—

A. S. GORDON, Secretary.

NORTHAMPTON GENERAL HOSPITAL. (408 Beds.) Applications are invited immediately from registered medical practitioners, Male and Female, for the appointment of CASUALTY OFFICER (A). Salary at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointment will be for a period of 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent as soon as possible to: GORDON S. STURTRIDGE.

WREXHAM AND EAST DENBIGHSHIRE WAR MEMORIAL HOSPITAL. Applications are invited from registered medical practitioners, Male and Female, for the appointment of 3 RESIDENT HOUSE SURGEONS (A), to commence immediately. Salary is at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply. Appointment will be for a period of 6 months.

Applications, stating age, nationality, qualifications, and accompanied by copies of testimonials, to—

LESLIE SPENCER, Secretary.

BRADFORD ROYAL INFIRMARY. Applications are invited from registered medical practitioners (Male, single) for the following appointments:—

(1) HOUSE SURGEON (B2) and (2) HOUSE PHYSICIAN (B2), vacant on 1st July, 1944. 6 months' appointments. Salary £150 p.a., with full residential emoluments. There are 372 Beds and 8 Resident Officers. R practitioners holding A posts may also apply.

Applications, stating age, nationality, qualifications, and previous experience, with copies of 3 recent testimonials, should be sent immediately to—

H. TRUSSON, House Governor and Secretary.

THE ST. HELENS HOSPITAL. Applications are invited for the position of VISITING PHYSICIAN. The Physician will be required to hold an Out-patients' Clinic once per week and to see patients in the wards.

Applications should be sent not later than Friday, 2nd June, to the Secretary.

The St. Helens Hospital, St. Helens, Lancs.

ROYAL NORTHERN INFIRMARY, Inverness. Assistant Patho-LOGIST wanted. Experienced in general pathological work, and willing to act as Assistant Medical Officer to Blood Transfusion Service. Salary in respect of both appointments £700 p.a.

Application to Medical Superintendent, Royal Northern Infirmary, Inverness.

BRISTOL ROYAL HOSPITAL (incorporating the Bristol Royal INFIRMARY and BRISTOL GENERAL HOSPITAL). Applications are invited for the following resident appointments for the 6 months commencing 1st July, 1944 :—

CASUALTY OFFICER (B1). Salary at the rate of £130 p.a., plus war bonus at the rate of £20 p.a., with full board, residence, and laundry.

CASUALTY OFFICER AND RESIDENT ANÆSTHETIST (A).

HOUSE SURGEON (A) to the Fracture Department.

HOUSE SURGEON (A) to the E.N.T. Department.

HOUSE SURGEON AND SECOND CASUALTY OFFICER (A).

HOUSE SURGEON AND SECOND FRACTURE HOUSE SURGEON (A).

3 HOUSE SURGEONS (A) and 2 HOUSE PHYSICIANS (A).

Salary in each case at the rate of £80 p.a., plus war bonus at the rate of £20 p.a., with full board, residence, and laundry.

The conditions of the Central Medical War Committee governing B1 and A appointments apply respectively to the above vacancies.

Applications to be made on forms to be obtained from—

ELLIS C. SMITH, F.C.I.S.,
Bristol Royal Infirmary. Secretary and House Governor.

CITY OF PLYMOUTH. City General Hospital. Applications are invited from duly qualified and registered medical practitioners, Male and Female, including practitioners within 3 months of qualification and liable under the National Service Acts, for the appointment of JUNIOR ASSISTANT MEDICAL OFFICER (A) at the City General Hospital. The appointment will be for a period of 6 months, but terminable by 1 month's notice on either side at any time. Salary is at the rate of £250 p.a., plus war bonus, and full residential emoluments. All fees received by the officer must be refunded to the Council. The duties will be mainly on the surgical side of the Hospital.

Further details may be obtained from the Medical Superintendent of the Hospital. Forms of application are not provided. Applications must be addressed to the undersigned, together with copies of not more than 3 recent testimonials, as soon as possible. T. PEIRSON, Medical Officer of Health.

Seven Trees, Lipson-road, Plymouth.

COUNTY BOROUGH OF WALSALL. Manor Hospital. Applica-tions are invited from registered medical practitioners, Male and Female, for the appointments of :—

JUNIOR ASSISTANT MEDICAL OFFICER (A). Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months ; otherwise for a period of 12 months.

RESIDENT ANÆSTHETIST (B2). The salary is at the rate of £350 p.a., rising by £25 to £425 p.a., with full residential emoluments. The officer appointed will act under the direction of the Medical Superintendent, and perform such other duties as may be required. R and W practitioners who now hold A posts may apply, when appointment will be limited to 6 months ; otherwise for a period not exceeding 4 years.

Applications should be sent as soon as possible to—

JAMES A. M. CLARK, Medical Officer of Health.
Council House, Walsall, 13th May, 1944.

VICTORIA HOSPITAL, Accrington. Applications are invited from medical practitioners (Male) for the appointment of HOUSE SURGEON (B2). The salary is at the rate of £200 p.a., with full residential emoluments. R practitioners who now hold A posts may apply, when the appointment will be limited to 6 months.

Apply, with copies of 2 testimonials, to Hon. Secretary.

THE ROYAL HOSPITAL, Wolverhampton. (Incorporated under Royal Charter.) (310 Beds.) Applications are invited from registered medical practitioners, Male, for the appointment of CASUALTY OFFICER (B2), now vacant. Salary is at the rate of £150 p.a., with full residential emoluments. R practitioners who hold A posts may apply, when the appointment will be limited to 6 months.

16th May, 1944. W. COCKBURN, House Governor.

THE ROYAL HOSPITAL, Wolverhampton. (Incorporated under Royal Charter.) (310 Beds.) Applications are invited from registered medical practitioners, Male or Female, for the appointment of RESIDENT ANÆSTHETIST (B2), vacant 20th June. The salary is at the rate of £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months ; otherwise for a period of 12 months.

12th May, 1944. W. COCKBURN, House Governor.

THE ROYAL HOSPITAL, Wolverhampton. (Incorporated under Royal Charter.) (310 Beds.) Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A), vacant the end of May. Salary is at the rate of £100 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

24th April, 1944. W. COCKBURN, House Governor.

EXMINSTER HOSPITAL, Devon. Applications are invited from registered medical practitioners, Male and Female, for the following appointment, now vacant. It is desirable that candidates should be interested in orthopædic work, as Exminster Hospital is a Fracture A Hospital and has 220 Fracture and Orthopædic Beds :—

HOUSE SURGEON (A). Salary at the rate of £120 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months ; otherwise may be extended to 1 year.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent as soon as possible to the Medical Superintendent, Exminster Hospital, Exminster, near Exeter, Devon.

THE PRINCE OF WALES'S HOSPITAL, Plymouth. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON to Special Departments and CASUALTY OFFICER (A) for duty at the Greenbank Road Section, vacant forthwith. Salary is at the rate of £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

ARTHUR R. CASH, General Superintendent.
Head Office : Greenbank-road, Plymouth, 20th April, 1944.

THE PRINCE OF WALES'S HOSPITAL, Plymouth. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A), vacant forthwith. Salary is at the rate of £175 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

ARTHUR R. CASH, General Superintendent.
Head Office, Greenbank-road, Plymouth.

ROYAL UNITED HOSPITAL, Bath. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON (A) (Gynæcology and Anæsthetics). Salary £150, with board, residence, and laundry. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications should be sent immediately to—

J. LAWRENCE MEARS, Secretary-Superintendent.

ROYAL UNITED HOSPITAL, Bath. Applications are invited from registered medical practitioners for the appointments of 3 HOUSE SURGEONS (A). Salary for each post £150 p.a., with board, residence, and laundry. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointments will be for a period of 6 months.

Applications at once to— J. LAWRENCE MEARS,
8th February, 1944. Secretary-Superintendent.

UNIVERSITY OF BRISTOL. The University invites applications for a DEMONSTRATOR IN ANATOMY (Temporary). Salary £300 p.a.

Applications should reach the undersigned, from whom further particulars may be obtained, on or before 31st May, 1944.

WINIFRED SHAPLAND, Secretary and Registrar.

UNIVERSITY OF BRISTOL. The University invites applications for an ASSISTANT LECTURER IN PATHOLOGY (Temporary). Salary £300–£400 p.a., according to qualifications and experience.

Applications should reach the undersigned, from whom further particulars may be obtained, on or before 31st May, 1944.

WINIFRED SHAPLAND, Secretary and Registrar.

EAST RIDING COUNTY COUNCIL. Beverley Emergency HOSPITAL. Applications are invited from registered medical practitioners, Male and Female, for the following appointments :—

HOUSE SURGEON (B2), vacant immediately. The salary is at the rate of £200 p.a., with full residential emoluments. R and W practitioners who now hold A posts may apply, when the appointment will be limited to 6 months ; otherwise for a period not exceeding 1 year, subject to 1 month's notice on either side.

HOUSE SURGEON (A), vacant immediately. The salary is at the rate of £120 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months ; otherwise for a period not exceeding 1 year, subject to 1 month's notice on either side.

Applications to be made as soon as possible to—

T. STEPHENSON, Clerk of the Council.
County Hall, Beverley, 11th May, 1944.

WESTON-SUPER-MARE GENERAL HOSPITAL. (150 Beds.) Applications are invited from medical practitioners (Male) for the appointment of HOUSE PHYSICIAN (A), duties to commence 6th June. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when the appointment will be for 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be addressed to : LESLIE J. FURSLAND, Secretary.

NORFOLK AND NORWICH HOSPITAL, Norwich. Applications are invited from registered medical practitioners (Male and Female) for the appointment of HOUSE SURGEON (A). Salary is at the rate of £170 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to be addressed to—

FRANK INCH, House Governor and Secretary.

SCARBOROUGH HOSPITAL, Yorkshire. (Normally 140 Beds.) Applications are invited from Male registered medical practitioners for the post of HOUSE SURGEON (A). The appointment is for 6 months commencing immediately, and the salary is at the rate of £200 p.a., with board, residence, laundry, &c. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply.

Applications, with age, testimonials, qualifications, &c., to be sent immediately to the Secretary.

EAST SURREY HOSPITAL, Redhill. (90 Beds, plus 40 E.M.S.) Applications are invited from registered medical practitioners, Male or Female, for the appointment of RESIDENT HOUSE SURGEON (A), vacant now. Salary at the rate of £150 p.a., plus full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months ; otherwise for at least 6 months.

Applications, with copies of 3 recent testimonials, should be sent to : E. C. AYLING, Secretary.

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COUNTY BOROUGH OF NORTHAMPTON. Locum (B1 post) (Man or Woman) wanted with experience of tuberculosis work and preferably X-ray work and A.P. treatment, to take charge of the Tuberculosis Dispensary during the absence of the Clinical Tuberculosis Officer for a period of at least 1 month. Salary at the rate of 12 guineas per week.

Applications, mentioning age and experience, together with testimonials, should be sent to the Medical Officer of Health, 7A, St. Giles'-square, Northampton.

ROYAL BERKSHIRE HOSPITAL, Reading. Applications are invited from registered medical practitioners, Male and Female, for the post of HOUSE SURGEON (A) (General and Eye), vacant 1st July, 1944. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when the appointment will be for a period of 6 months.

Applications, stating age, qualifications with dates, nationality, and present post, and accompanied by copies of 3 recent testimonials, should be sent immediately to—

H. E. RYAN, Secretary and House Governor.

LIVERPOOL AND DISTRICT HOSPITAL FOR DISEASES OF THE HEART, 34, Oxford-street, LIVERPOOL, 7. Applications are invited from registered medical practitioners (Male or Female) for the appointment of a HOUSE PHYSICIAN (A), to commence 1st July. Salary is at the rate of £100 p.a., with full residential emoluments. Facilities for M.D. thesis. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent to: Miss J. LEWIS, Secretary.

ROYAL ALBERT EDWARD INFIRMARY AND DISPENSARY, WIGAN. Applications are invited from registered medical practitioners (Male) for the appointment of 2 HOUSE SURGEONS (A), vacant 18th June, 1944. Salary in each instance is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointments will be for a period of 6 months; otherwise may be extended for a further period.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent as soon as possible to—

A. STANLEY BRUNT, General Superintendent and Secretary.

DISTRICT INFIRMARY, Ashton-under-Lyne. (200 Beds, mainly surgical.) Applications are invited from registered medical practitioners, Male or Female, preferably with experience of anæsthetics, for the appointment of HOUSE SURGEON (A), immediately. Commencing salary is at the rate of £200 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may also apply, when the appointment will be for a period of 6 months.

Applications, stating age, qualifications with dates, and nationality, and accompanied by copies of 3 recent testimonials, should be sent immediately to—

FRANK OLIVER, General Superintendent and Secretary.

HULL ROYAL INFIRMARY. Applications are invited from registered medical practitioners for the post of CASUALTY OFFICER (A), vacant now. Duties in the Casualty and Out-patient Departments and some ward work. Salary £200 p.a. The post carries full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications should be addressed to—

R. J. CARLESS, House Governor.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) Resident ANÆSTHETIST AND ASSISTANT CASUALTY OFFICER (A), required to commence as soon as possible. Salary at the rate of £150 p.a. with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications to—

H. J. JOHNSON,
General Superintendent and Secretary.

HUDDERSFIELD ROYAL INFIRMARY. (321 Beds.) Casualty OFFICER (B2) required to commence 3rd July, 1944. R and W practitioners who now hold A posts may apply, when appointment will be limited to 6 months. Salary at the rate of £200, with full residential emoluments.

Applications should be sent as soon as possible to—

H. J. JOHNSON, General Superintendent and Secretary.

STOCKPORT INFIRMARY. (159 Beds.) Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN (A), vacant 28th June. Salary is at the rate of £150 p.a., with full residential emoluments. Practitioners within 3 months of qualification and liable under the National Service Acts may apply, when appointment will be for a period of 6 months.

Applications, stating age, nationality, and qualifications, with copies of 3 testimonials, should be sent not later than 5th June to: H. G. PRICE, Secretary-Superintendent.

MINISTRY OF PENSIONS. Newquay Hospital, Cornwall. Applications are invited from registered medical practitioners for the following appointment at the above-mentioned Ministry of Pensions Hospital:—

SENIOR SURGEON (B1). Salary £800 p.a., with Civil Service war bonus and free board and lodging or an allowance of £100 p.a. in lieu thereof.

Applicants should have had experience in general surgery, preference being given to those holding a higher surgical qualification. Suitably qualified R practitioners holding B1 posts who have been rejected by the R.A.M.C. are invited to apply.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 2 recent testimonials, should be addressed to the Secretary, Ministry of Pensions, Medical Services Division, Norcross, Blackpool, Lancs.

SOUTHERN RHODESIA GOVERNMENT MEDICAL SERVICE. Applications are invited from fully qualified Male medical practitioners for appointment as GOVERNMENT MEDICAL OFFICER in the Southern Rhodesia Government Medical Service. Salary will be on the scale £1000 by £50 to £1250, and the salary will commence from the date of assumption of duty in Southern Rhodesia. Applicants must hold registrable medical degrees and Diploma in Public Health. D.T.M. & H. is also desirable. The successful applicant will be required to sign an agreement for 3 years' service in the first instance, thereafter application may be made to be placed on the pensionable establishment. A free steamship passage to Cape Town and first-class railway ticket thence to Southern Rhodesia will be provided. No applicants over the age of 35 years will be considered. Canvassing, either directly or indirectly, will disqualify applicants.

Applications, stating age, qualifications, and experience, together with copies of testimonials, should reach the Official Secretary, Office of the High Commissioner for Southern Rhodesia, Rhodesia House, 429, Strand, London, W.C.2 (from whom further particulars and application form may be obtained), not later than 12th June, 1944.

SUDAN MEDICAL SERVICE. There are vacancies for British-born medical Men. Candidates should be under 30 years of age and unmarried. Salary commences at £E.720 (approximately £738) a year. Some postgraduate experience is essential and preference would be given to holders of B appointments. Many members of the Service have done duty with the British Army and Sudan Defence Force and there is a growing strain on those who have been working more than 4 years without home leave. The maintenance of the efficiency of the African Medical Services has been generally recognised as a vital contribution to the United Nations War Effort and the Central Medical War Committee raises no objection to those selected taking up appointments in the Sudan.

Full particulars may be obtained from Dr. H. C. SQUIRES, Consulting Physician to the Sudan Government, 93, Harley-street, W.1 (Telephone: WEL 3423), who would be glad to see intending applicants at the earliest possible date.

Assistant Laboratory Technicians. King's College, Medical School, and ROYAL VICTORIA INFIRMARY, NEWCASTLE UPON TYNE, Department of Pathology requires applicants who are trained in histological and hæmatological techniques. Preference will be given to candidates holding, or in training for, the certificate of the I.M.L.T. in pathological technique.

Applications, stating age, experience, and present salary, should be sent not later than 5th June, 1944, to—

A. F. BERNARD SHAW, Professor of Pathology.
Royal Victoria Infirmary, Newcastle upon Tyne,
16th May, 1944.

Rowntree & Co., Ltd., require a full-time Medical Officer (Male) at York. The vacancy occurs through the calling up of the Medical Officer on military service, and the appointment will be of a temporary nature. Applicants should be over military age or otherwise ineligible for military service. Salary not less than £900 p.a.

Applications, stating qualifications, experience, age, date on which able to take up duty, should be made to the Labour Director, The Cocoa Works, York, to reach him not later than 9th June, 1944.

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